Monetary Policy in Transition

A Study of Bank of Canada Policy, 1982–85

Policy Study No. 1
C.D. Howe Institute

Peter Howitt

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To the memory of my father

Contents

Foreword vii

Acknowledgements ix

1 *Introduction* 1
Purpose of the Study 1
Conclusions and Policy Implications 2
Overview 6
A Reader's Guide 7

2 *Principles of Monetary Policy* 8
The Effect of Monetary Policy on Economic Activity 9
Adaptive Monetary Control 23
Summary 32

3 *Problems of Monetary Control* 35
Gradualism and Adaptive Monetary Control 35
The Definition of Money 38
Instability in the Demand for Money 44
Controlling Broadly Defined Money 52

4 *Macroeconomic Developments, 1982–85* 63
Inflation 63
Recession and Recovery 74

5 *The Conduct of Monetary Policy, 1982–85* 90
The Transition to Lower Inflation 90
The Strategic Transition 92
The Two Transitions 105
Summary 107

6 *A Critique of the Bank's Rationale for Increasing Monetary Restraint* 108
Inflation as the Prime Objective of Monetary Policy 108
Fear of Exchange-Rate Fluctuations 113
Which Exchange Rate? 119
Summary 123

7 *Managing the Transitions: An Assessment* 125
The Transition from High Inflation 125
The Strategic Transition 129

8 *Looking Ahead: Adaptive Monetary Control as a Strategy for Coping with an Uncertain World* 133
Challenges to Monetary Policy 134
Conclusion 139

Figures

1 The Problem of Transition from a High Rate of Inflation 30
2 Growth Rates of Canadian Monetary Aggregates, 1975–85 42
3 Velocity of Canadian M2, 1968–85 47
4 Growth of U.S. M2, 1976–86 88
5 Canadian and U.S. Short-Term Interest Rates, 1981–85 95
6 Canadian-U.S. Exchange Rate, 1981–85 96
7 G-10 Weighted-Average Exchange Rate, 1971–85 98
8 Weight-Average Exchange Rates, 1981–85 120

Tables

1 Alternative Definitions of Money 9
2 Growth Rates of Output, Prices, and Money in Canada, 1960–85 11
3 Changes in the Composition of M1-A in Canada, 1978 and 1984 46
4 Measures of Canadian Inflation, 1981–85 64
5 Year-to-Year Change in the Canadian Consumer Price Index, 1981–85 65
6 Change in the Canadian Consumer Price Index, Using the U.S. Method for Measuring Housing Costs, 1981–84 66
7 Implicit Price Deflators of Canadian Exports and Imports Relative to GNE Deflator, 1980–85 69
8 Canadian Dollar Exchange Rates Expressed in Different Currencies, 1980–85 70
9 Changes in Canada's GNE Deflator and in Export Prices of Selected Countries, 1981–85 71
10 Canada's Relative Unit Labor Cost, 1980–85 72
11 Indicators of Real Economic Activity in Canada, 1981–85 74
12 Year-to-Year Growth of Canadian M2+ and M3+, 1980–85 77
13 Canadian Interest Rates, 1981–85 79
14 Employment Rate by Canadian Region, 1980–85 82
15 Inflation-Adjusted Structural Deficit of Canada's Consolidated Government Sector, 1978–84 83
16 Indices of Real Money Supply in Canada, 1980–85 87
17 Real GNP in Canada and the United States, 1979 and 1982 112

Foreword

Monetary policy is perhaps the most potent yet least understood of economic policy instruments available to governments. For over a decade, the C.D. Howe Institute has sought to raise the level of public understanding and debate through periodic reviews of the conduct of monetary policy. This volume, the latest in the series, is the first prepared by Professor Peter Howitt of the University of Western Ontario. It provides a critical assessment of Canadian monetary policy in the 1982–85 period and extends the work of Professor Thomas Courchene, the author of five previous studies that are a comprehensive account of Canadian monetary policy during the 1970–82 period.

Professor Howitt's central theme is that monetary policy has been in a fundamental state of transition in the early 1980s. Policy decisions by the Bank of Canada were instrumental in bringing about a *macroeconomic* transition from high to low inflation. There also has been a *strategic* transition from Gradualism, which was the centerpiece of Bank of Canada policy in the late 1970s, toward a new strategy.

Based on his detailed analysis of macroeconomic performance and the conduct of monetary policy, Howitt concludes that while the Bank deserves considerable credit for initiating these two important transitions, it also can be criticized for moving too slowly to complete them.

A central concern of the analysis is that because of its failure to recognize fully the progress that was being made in reducing inflation, the Bank intensified monetary restraint in 1983 and early 1984, thereby contributing to the slow pace of recovery from the 1981–82 recession. In Howitt's view, the Bank should have moved more quickly to expand the broadly defined money supply to a level consistent with high employment and relative price stability. Howitt further argues that the Bank's failure to diagnose the situation was compounded by its tendency to over-emphasize the importance of the Canadian-U.S. dollar exchange rate in the setting of monetary policy. He demonstrates that what appeared to many to be a neutral policy of stabilizing this exchange rate in 1983 and 1984 was, in fact, a restrictive policy that produced an appreciation of the Canadian dollar against the currencies of Canada's major trading partners.

Howitt points out that since mid-1984, the Bank has placed less emphasis on the Canadian-U.S. dollar exchange rate and in the process has provided sufficient monetary expansion to move the economy toward fuller employment. In his view, the lesson of the 1982–85 period is that a flexible rule for controlling the growth of broadly defined money — a rule he calls

Adaptive Monetary Control — represents a promising monetary policy approach in the late 1980s.

Although this volume is an assessment of recent monetary policy, the author develops several other important themes that underpin his analysis. These include an examination of the practical problems central banks face when they attempt to control the money supply and a critical assessment of the methods economists use to measure and interpret inflation and exchange rates.

This study was undertaken as part of the Institute's policy analysis program in conjunction with the C.D. Howe Institute Policy Analysis Committee (HIPAC). The Institute believes this book will be a useful contribution to the understanding of Canadian monetary policy — informative to policymakers and experts yet understandable to the noneconomist. As with all Institute publications of this kind, the analysis and conclusions are those of the author and do not necessarily represent those of the Institute or its members.

Wendy Dobson
President

Acknowledgements

It is a pleasure to acknowledge the help of many people. Wendy Dobson provided the original suggestion and encouragement to undertake the project. I began work while on leave at Laval University at the kind invitation of Henri-Paul Rousseau. While there, I benefited from long conversations with Lloyd Paquin. I also learned a great deal about Canadian macroeconomic policy from Pierre Fortin, who later provided detailed comments on an early draft.

After returning to the University of Western Ontario, I received help from several of my colleagues. Thomas Courchene offered perceptive observations, detailed comments, and valuable hints from his long experience writing on Canadian monetary policy; he has set a standard that the rest of us can only try to achieve. Joel Fried gave many hours of his time and offered detailed comments and useful suggestions. I also had helpful conversations with, and received valuable suggestions from, David Laidler and Ron Wirick. Several officials at the Bank of Canada, especially Charles Freedman and Stephen Poloz, were generous in providing data, responding to questions, and offering suggestions. Ed Neufeld of The Royal Bank of Canada provided comments on the first draft. Mario Fortin at Laval and George Stadler and Gordon Green at Western provided able research assistance.

The entire staff of the C.D. Howe Institute has helped in one way or another. I particularly want to thank Ted Carmichael for his encouragement, his many insightful suggestions, and his patience in coping with many missed deadlines; Richard Lipsey for his encouragement and wise counsel; and Barry Norris for his expert editing. Yvonne Adams and her staff in the Word Processing Centre in the Western Economics Department typed all drafts of the manuscript with speed and efficiency; Cordelia Sharpe of the C.D. Howe Institute prepared the manuscript for publication. Pat, Suzanne, Paul, and Katherine made the study possible by putting up with long absences.

Peter Howitt

1

Introduction

Purpose of the Study

During the 1970s, monetary policy became the subject of widespread public interest in Canada In the early part of the decade, the spread of monetarism helped persuade many Canadians that inappropriate monetary policy was at the root of inflation. In 1975, the Bank of Canada stepped into the center of public attention by acknowledging its responsibility for inflation and vowing to lead the fight against it with a new strategy called Gradualism,[1] a program to bring the growth of narrowly defined money (M1) gradually under control. In the first few years of Gradualism, the Bank's publicly announced target ranges for the growth of M1 helped keep monetary policy in the news. As inflation continued to rise in the late 1970s and early 1980s, an intense public debate arose over whether Gradualism was working.

Interest in monetary policy reached a peak in 1981 and 1982, when the Bank abandoned Gradualism for a more severe, less gradual approach to fighting inflation. During this period, M1 fell far below its target range, interest rates reached unprecedented heights, and the economy entered a deep recession. The Bank was under enormous political and social pressure to ease its policies. It did not yield to this pressure, but the campaign that it mounted to explain and defend its policies in various forums put the Governor of the Bank more actively into the political fray than at any time since the Coyne affair of the early 1960s.[2]

The economic problems that put monetary policy in the limelight have receded somewhat. Four years have passed since the Bank formally withdrew the M1 targets that attracted so much attention under Gradualism. Inflation and unemployment are still with us, but neither problem has the same urgency as it did in 1982.

Although monetary policy has drawn less attention lately, it continues to be a key factor in economic developments. Furthermore, the fact that the Bank has been in the thick of public life since its founding in 1935 sug-

[1]The term "Gradualism" is used throughout the book to refer to the Bank's policy of targeting M1. The term also has a broader meaning — namely, that of any policy attempting to reduce inflation in gradual stages, by whatever means. To emphasize that the term is being used in the more specific sense, it is capitalized.

[2]James Coyne, the Governor of the Bank, resigned in 1960 after a bitter conflict with the Diefenbaker government over the issue of whether the Bank or the government was responsible for the tight monetary policy that was being followed at the time.

gests that any lull in public interest will be temporary. No one can predict with certainty what the most important economic challenges of the second half of the 1980s will be, but it is a safe bet that monetary policy will be crucial in dealing with them.

Thus, now is a good time for taking stock. Monetary policy is in transition, in two senses. First, monetary policy is involved in Canada's macroeconomic transition from the high rates of inflation of the 1970s and early 1980s to what one can only hope will be a new era of prosperity with much lower inflation. Second, the Bank's strategy is evolving from Gradualism toward one that is as yet undetermined. It is time to ask what role the Bank has played in winding down inflation since 1981, how the Bank's strategy has developed since Gradualism, how well the Bank has performed in these two transitions, where the transitions are leading, and where they should be leading.

The purpose of this study is to examine these questions and to provide a critical examination of the conduct of monetary policy during the 1982–85 period. The study also addresses the question of what strategy the Bank should follow when the macroeconomic transition that has been its primary concern for over a decade reaches completion, and when new economic challenges confront Canadians in the future.

Although the study focuses on the 1982–85 period, the analysis of this period requires some discussion of earlier events; similarly, any recommendations necessarily involve an attempt to look beyond 1986. The discussion of earlier events relies heavily on the excellent series of studies by Thomas Courchene of the University of Western Ontario.[3]

Conclusions and Policy Implications

In the chapters that follow, I argue that the Bank moved in the right direction with both transitions — the macroeconomic transition from high

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[3]Thomas J. Courchene, *Money, Inflation, and the Bank of Canada: An Analysis of Canadian Monetary Policy from 1970 to Early 1975* (Montreal: C.D. Howe Research Institute, 1976); idem, *Money, Inflation, and the Bank of Canada, Volume II: An Analysis of Monetary Gradualism, 1975–80* (Montreal: C.D. Howe Institute, 1981); idem, *Monetarism and Controls: The Inflation Fighters* (Montreal: C.D. Howe Research Institute, 1976); idem, *The Strategy of Gradualism: An Analysis of Bank of Canada Policy from Mid-1975 to Mid-1977* (Montreal: C.D. Howe Research Institute, 1977); and idem, *No Place to Stand? Abandoning Monetary Targets: An Evaluation* (Toronto: C.D. Howe Institute, 1983).

Jean-Marie Dufour and Daniel Racette have reviewed thoroughly the literature on Canadian monetary policy. See "Monetary Control in Canada," in John Sargent, research coordinator, *Fiscal and Monetary Policy*, Collected Research Studies of the Royal Commission on the Economic Union and Development Prospects for Canada no. 21 (Toronto: University of Toronto Press, 1986), pp. 199–256. In the same volume, Gordon Sparks presents a concise overview of the postwar conduct of monetary policy. See "The Theory and Practice of Monetary Policy in Canada," pp. 119–149.

inflation and the strategic transition from Gradualism — but that in both cases, it moved too slowly. I also argue that the Bank should adopt a strategy of controlling broadly defined money. The rest of this section presents a more detailed summary of these conclusions and recommendations.

The Macroeconomic Transition from High Inflation

The Bank of Canada deserves credit for having brought inflation down from the high levels of the late 1970s and early 1980s. It did so by reducing the rate of expansion of the money supply. This restrictive monetary policy also contributed to the 1981–82 recession, but, to a large extent, that was unavoidable. Curing inflation requires monetary restraint, and monetary restraint almost always has a short-term cost in unemployment and lost output. By 1981, inflation had become such a serious problem that it was worth paying a high price to cure it.

During the 1982–84 period, however, the Bank's policy was more restrictive than was needed to carry on the fight against inflation. During those years, a continuation of monetary restraint was needed because the rate of inflation was still unacceptably high. But monetary restraint was not just continued, it was intensified. This increasingly restrictive policy was an important reason why recovery from the recession was so painfully slow.

From mid-1984 through 1985, the Bank performed well, by finally moving from its policy of monetary restraint to one of more rapid monetary expansion. In the first half of 1985, this change of policy contributed to a revitalization of the recovery. It did not have serious inflationary consequences because the Canadian economy was still operating with considerable excess capacity during this period. Instead, the relaxation of restraint can be seen as the second phase of the transition from high inflation; a phase in which the unemployment and excess capacity created in the first phase was eliminated without forcing the economy to go through deflation. If the Bank is to be criticized, it should not be for having entered into this phase of the transition but, rather, for having started so late.

In 1987, it will be important for the Bank to take steps toward bringing to an end the burst of monetary expansion that began in 1984. Enough monetary stimulus will have been added to put the Canadian economy back on the road to full employment and, therefore, to complete phase two of the transition from high inflation. If rapid monetary expansion continues beyond 1986, inflation is likely to re-emerge as a serious economic problem.

The Strategic Transition from Gradualism

The transition from Gradualism to more abrupt tightening of monetary policy was necessary in order to bring down inflation. Under Gradualism, the rate of monetary expansion had not been reduced sufficiently to affect

the rate of inflation. The main flaw of Gradualism was its concentration on a narrow concept of the money supply (M1) rather than on a broader definition of money.

The Bank's strategy since Gradualism has been one of resisting depreciation of the Canadian dollar against the U.S. dollar. From late 1978 until early 1984, this policy had the effect of putting Canada on a virtually fixed exchange rate against a trade-weighted average of currencies of the so-called Group-of-Ten (G-10) countries. This exchange-rate policy succeeded initially in bringing down the rate of monetary expansion. But it was also responsible for the excessive prolongation of monetary restraint through 1984. The Bank was forced to continue reducing the rate of monetary expansion in order to resist depreciation in the face of unusually high real interest rates in the United States. It should have paid less attention to stabilizing the exchange rate and more attention to achieving an appropriate rate of monetary expansion.

The Bank's primary reason for adopting this policy was the belief that a substantial depreciation would lead to a prolonged and serious inflation even if the rate of monetary expansion were kept under control. The empirical grounds for this belief are questionable, especially under the circumstances that prevailed in Canada during the 1982–84 period.

The Bank also paid too much attention to the Canadian-U.S. dollar exchange rate rather than to an appropriate, weighted-average exchange rate. The G-10 exchange rate that the Bank effectively stabilized until early 1984 is too heavily weighted toward the U.S. dollar. A more appropriate weighted average shows that the Canadian dollar appreciated steadily until early 1984. This appreciation intensified Canada's monetary deceleration and exacerbated the harmful effects of high world interest rates on the Canadian economy.

The Bank has been concerned that volatile foreign interest rates and unstable exchange-market expectations can cause undesirable fluctuations in the external value of the Canadian dollar, particularly if people begin to doubt the Bank's resolve to resist depreciation. To some extent, this concern is legitimate, but there are good reasons for believing the Bank's worries are exaggerated. There is also reason to believe that a deficiency in the Bank's strategy may have been responsible for the sensitivity of exchange-market expectations to perceived weakness on the Bank's part. Specifically, the Bank has operated without any clearly announced target value for the exchange rate, which unintentionally may have encouraged speculators to sell dollars at the sign of any weakness.

The Bank's attitude eventually changed, and it allowed a significant depreciation to occur between the beginning of 1984 and the end of 1985, finally bringing monetary deceleration to an end. This change in attitude was overdue. But if it means that the Bank is now paying more attention to the behavior of broadly defined money, then its strategic transition is now going in the right direction.

Looking Ahead: Adaptive Monetary Control

The Bank would not have allowed inflation to have become entrenched in the early 1970s, nor would it have been so slow in bringing down the rate of inflation or in bringing to an end the excessively long monetary deceleration of the 1980s, had it paid more attention to the growth of broadly defined money. To avoid committing similar errors in the future, the Bank should follow a strategy that can be called "Adaptive Monetary Control": a strategy to ensure that the growth of broadly defined money is normally kept inside a narrow target range. The main virtue of Adaptive Monetary Control is that it would help avoid the most serious macroeconomic problems — sustained inflation and severe recession. It also would provide the economic system with an automatic stabilizer to dampen unwanted fluctuations in output and employment.

If the Bank is to follow Adaptive Monetary Control, it will have to foresake the objective of stabilizing the external value of the Canadian dollar over periods of longer than a few weeks. Exchange-rate and interest-rate fluctuations are not just necessary evils of controlling broad money but are a vital part of the automatic stabilizing mechanism of Adaptive Monetary Control.

The experience of Canada under Gradualism, and that of other countries under similar targeting regimes, has pointed out several problems with monetary control. This experience contains some valuable lessons for monetary policy, but it does not undermine the case for Adaptive Monetary Control. Canada's problems arose mainly because, under Gradualism, the Bank controlled M1, the wrong monetary aggregate. The problems that the United States experienced in the 1979–82 period arose because the Federal Reserve tried to control money too tightly — to hit a target each month rather than over a longer period of time — and because it operated under a flawed system of lagged and differential reserve requirements.

Adaptive Monetary Control could avoid the problems of Gradualism by controlling broadly defined money. Furthermore, instead of focusing exclusively on a single definition of money, the Bank should monitor a broad range of aggregates. Similarly, problems such as those the United States experienced could be avoided by maintaining a looser control and by implementing contemporaneous reserve requirements that are applied uniformly across all deposit-taking institutions.

Adaptive Monetary Control is not a magic substitute for the discretion of the Bank of Canada. Occasionally, there will be times when the money supply should be allowed temporarily to grow faster or slower than its long-term target rate. An important example is the second phase of a transition from high inflation, when a temporary surge of money growth is needed to reduce unemployment.

The most commonly discussed alternatives to Adaptive Monetary Control are, first, some form of exchange-rate stabilization and, second, nominal-

income targeting. The latter would produce almost the same result as Adaptive Monetary Control, but nominal income is considerably harder to control than is broadly defined money and many people would regard an attempt to control their incomes directly as going beyond the Bank's jurisdiction.

Overview

In writing this study, the several audiences that it is intended to reach — monetary theorists, practitioners and close observers of monetary policy, and interested noneconomists — have been kept in mind. To reach to monetary theorists, the analysis has to be conducted within a theoretical framework that indicates in general terms how monetary policy influences the economy. Chapter 2 presents the analytical principles on which the study is based. It also develops the argument for Adaptive Monetary Control as a benchmark against which to judge the Bank's conduct.

To be useful and credible to practitioners and close observers of monetary policy, the study must address the difficult practical problems that have arisen in Canada and elsewhere under monetary targeting regimes. Chapter 3, therefore, deals with questions of which definition of money to use, whether the demand function for money is sufficiently stable for monetary control to be workable, what control instrument to use, and whether broadly defined money can be controlled with sufficient precision. In addition, the study requires a detailed statement of my own interpretation of the major macroeconomic events of the 1982–85 period and their primary causes. Chapter 4 thus provides an interpretation of the factors that led to the 1981–82 recession, the fall in inflation that started at about the same time, and the long recovery from the recession. The chapter does not just chronicle these events but also discusses the roles that monetary policy and other determining influences played in shaping them. The chapter concludes that although recent depreciation temporarily may have slowed the fall in inflation, there is good reason to believe that the fall will continue as long as unemployment and excess capacity remain high.

Chapter 5 examines in closer detail the Bank's performance in the two transitions that were under way during the 1982–85 period and shows that each of these transitions consisted of two phases. The transition from high inflation involved, first, a monetary deceleration that brought inflation down and, second, a monetary revival starting in the 1984–85 period that helped speed up the recovery from the recession created in the first phase. The two phases of the transition from Gradualism were, first, a shift in emphasis from controlling M1 to controlling the Canadian-U.S. dollar exchange rate and, second, a gradual shift in emphasis away from avoiding depreciation against the U.S. dollar and toward reviving the rate of monetary expansion. One of the striking facts that the analysis in Chapters 4 and 5 uncovers is that the Bank intensified monetary restraint during the 1982–84 period despite the fall in inflation and persistently high unemployment.

For the broader audience of noneconomists, the study is intended to provide a readable and, to the extent possible, nontechnical critique of Bank of Canada policies that is consistent with my underlying views on monetary theory, the practical problems of monetary control, and the interpretation of recent macroeconomic performance. This critique begins in Chapter 6 with an analysis of the Bank's rationale for the intensification of monetary restraint. It examines several questionable judgments that caused the Bank to give too much weight to the objective of reducing inflation and too little to the objective of reducing unemployment. Chapter 6 then builds the case that the Bank was overly fearful of exchange-rate fluctuations, and it argues that by effectively stabilizing the G-10 weighted-average exchange rate, the Bank was placing too much weight on the Canadian-U.S. dollar exchange rate.

The critique is completed in Chapter 7, which presents an overall assessment of the Bank's performance in managing the two transitions, judged against the benchmark of Adaptive Monetary Control. The main points of this assessment have already been listed in the preceding section of this chapter.

Finally, Chapter 8 looks at the future conduct of monetary policy, by identifying some of the key challenges the Bank of Canada is likely to encounter during the rest of the 1980s. An analysis of how Canada would fare in the face of these challenges shows that a strategy of Adaptive Monetary Control generally would produce a superior outcome to that produced by exchange-rate stabilization. Adaptive Monetary Control almost certainly would not produce a disastrous outcome; even in that unlikely event, it probably would work no worse than exchange-rate stabilization. In short, Adaptive Monetary Control is a superior strategy for coping with an uncertain future.

A Reader's Guide

This study is organized in such a way as to make it both useful to the specialist and accessible to the interested layperson. The student of monetary policy should read the study in its entirety. The reader who does not want to spend much time on theory or on the technical problems of conducting monetary policy can skip directly to the summaries contained in Chapters 2 and 3. These provide the essentials for following the discussion in later chapters. The reader who is familiar with the macroeconomic developments of the early 1980s, discussed in Chapter 4, can proceed directly to Chapters 5, 6, and 7, which provide a detailed review and critique of monetary policy during the 1982–85 period. Anyone who is interested in the future conduct of monetary policy will want to read Chapter 8.

2

Principles of Monetary Policy

This chapter presents the basic principles on which the analysis in the rest of the study is based. Most of these principles address questions of how monetary policy affects the Canadian economy. Through what channels and to what degree do the Bank of Canada's actions influence the rate of inflation, the rate of unemployment, the value of the Canadian dollar on foreign currency markets, and the level of interest rates? What constraints are placed on these actions by the high degree of openness of the Canadian economy to international flows of capital and of goods and services? What goals can monetary policy realistically be expected to accomplish, and what goals are impossible to achieve?

The principles are intended not just to answer these analytical questions but also to provide a benchmark that indicates how monetary policy should be conducted and against which one can evaluate the Bank's performance. Should the Bank attempt to stabilize interest rates, to maintain a low rate of unemployment, to keep inflation from rising too high, to stabilize the value of the Canadian dollar, or to achieve some other goal? More realistically, what relative weights should be assigned to conflicting goals? And by what means should the Bank seek to accomplish its objectives?

To be useful, principles must be based as soundly as possible on economic science and the lessons of economic history. But even my most objective principles inevitably will reflect my own theoretical preconceptions, because economics is not an exact science and because the facts do not speak for themselves — people with different *a priori* views will interpret them differently. It will become apparent that the views presented in this study have been strongly influenced by the monetarist school of thought as exemplified in the writings of Milton Friedman and those of Canadian economists such as David Laidler and Thomas Courchene. But it would not be accurate to label these views as monetarist. Indeed, they may be labeled as dangerously Keynesian by many economists who call themselves monetarists, especially since I attach relatively little importance to the so-called credibility effect of monetary policy on wage- and price-inflation and do not believe that monetary policy should be guided entirely by rules rather than discretion.

The next section of this chapter discusses the effect of monetary policy on economic activity. The end of this section deals at length with the

Table 1
Alternative Definitions of Money

Monetary aggregate	Definition
Base	Currency in the hands of the public plus chartered bank reserves
M1	Currency in the hands of the public plus demand deposits at chartered banks
M1-A	M1 plus daily interest chequable savings accounts plus nonpersonal notice deposits
M2	M1 plus notice deposits plus personal term deposits
M2+	M2 plus deposits at trust and mortgage loan companies (TMLs) plus deposits and shares at credit unions and caisses populaires (CUCPs)
M2++	M2+ plus Canada Savings Bonds (CSBs)
M2-C	Currency in the hands of the public plus all privately held Canadian dollar deposits at chartered banks
M3	M2-C plus foreign currency deposits at chartered banks booked in Canada by Canadian residents
M3+	M3 plus TML deposits plus CUCP deposits and shares
M3++	M3+ plus CSBs plus Treasury Bills and short-term paper net of holdings of chartered banks and their mortgage subsidiaries

international considerations that have played a major role in recent Bank of Canada policy. The following section constitutes an argument for Adaptive Monetary Control, a policy of keeping the money supply, broadly defined, close to a steady target path. This policy is the main benchmark by which this study assesses the Bank's performance. The last section provides a detailed summary of the chapter.

The Effect of Monetary Policy on Economic Activity

The Supply of Money

Monetary policy affects the economy mainly by altering the supply of money — the amount of currency in the hands of the public plus holdings of chartered bank deposits and other liquid assets. As Table 1 shows, there are many definitions of money. Some of the broader definitions include deposits with nonbank financial intermediaries such as trust and mortgage loan companies, credit unions, and caisses populaires. Some also include nondeposit liquid assets such as Canada Savings Bonds. For reasons that are analyzed in Chapter 3, this study uses a broad definition of money — specifically, M2 or one of the more inclusive ones listed below M2 in Table 1.

The Bank affects the supply of money by various operations that change the size of the monetary base — the narrowest of definitions in Table 1. Increasing the base has the effect of reducing interest rates and allowing banks to expand by making new loans and issuing new deposits, thereby causing the supply of money to grow by some multiple of the change in the base.

One operation by which the Bank changes the size of the base is through the management of federal government deposits. The federal government maintains an account with the Bank. It also maintains accounts with the chartered banks. Every time the government transfers money from its Bank of Canada account to its accounts with the chartered banks, the chartered banks find that their reserves automatically go up by the same amount — that is, the size of the base automatically rises by the amount of the transfer. When the government transfers money in the other direction, the withdrawal of reserves from the chartered banks makes the base contract automatically. The Bank is empowered to make such transfers, and it does so on a daily basis.

The Bank's direct purchases of federal government securities also play an important role in determining the size of the base. When the Bank buys newly issued securities, it credits the proceeds to the government's Bank of Canada account. This does not directly raise the monetary base, but it permits other measures to be taken that do increase the base. For example, the Bank could transfer some of the new balances into the government's chartered bank accounts. Alternatively, the government could use the balances to cover its expenditures, thereby transferring the balances into the hands of the public and making them part of the monetary base.

Another means of changing the base is through direct intervention in the foreign exchange market. When the Bank purchases Canadian dollars on the open market using its reserves of foreign exchange, those dollars are automatically withdrawn from circulation — unless the Bank simultaneously transfers an equal amount of government deposits to the chartered banks. Similarly, when it sells Canadian dollars, those dollars are added to the monetary base. The Bank does not engage in this kind of intervention on a daily basis, but it has been intervening with increasing frequency in recent years.

Open-market purchases and sales of government securities by the Bank affect the monetary base in exactly the same way as does direct intervention in the foreign exchange market. Advances to chartered banks are another means, but they are more properly regarded as operations undertaken at the instigation of the chartered banks rather than as Bank of Canada operations. Advances to money-market dealers should be regarded similarly.

Variations in the Bank's primary reserve requirements may alter the quantity of money, not by changing the base but by changing the amount

Table 2
Growth Rates of Output, Prices, and Money in Canada, 1960–85
(annual percentage change)

	Real GNP	Consumer Price Index	Money supply (M2-C)
1960	2.8	1.2	4.6
1961	9.2	0.9	8.7
1962	6.8	1.2	3.8
1963	5.1	1.7	6.4
1964	6.7	1.8	7.3
1965	6.6	2.4	12.0
1966	6.9	3.7	6.6
1967	3.3	3.6	16.2
1968	5.9	4.0	13.1
1969	5.3	4.6	3.7
1970	2.6	3.3	12.6
1971	6.7	2.9	14.5
1972	6.2	4.8	17.8
1973	7.6	7.5	14.1
1974	3.6	10.9	21.3
1975	1.2	10.8	18.4
1976	5.8	7.5	17.3
1977	2.0	8.0	15.9
1978	3.6	9.0	12.7
1979	3.2	9.1	19.6
1980	1.1	10.1	18.1
1981	3.3	12.5	16.0
1982	−4.4	10.8	6.0
1983	3.3	5.8	1.0
1984	5.0	4.4	2.1
1985	4.5	4.0	5.9

Source: *Bank of Canada Review*, various issues.

of money that can be supported by a given base. Since 1981, however, these requirements have been set by the *Bank of Canada Act* and are not subject to discretionary change by the Bank. The Bank can vary secondary reserve requirements but it has not used this instrument actively in over ten years. (Secondary reserves consist of excess primary reserves, day-to-day loans, and Treasury Bills.)

Two Historical Generalizations

Since 1960, the rate of inflation has been correlated with the rate at which the money supply has grown (the rate of monetary expansion), as Table 2 shows.[1] Although the correlation is very weak on a year-to-

[1]The definition of money used in Table 2 is M2-C. The choice of M2-C is dictated by the fact that no data exist on any other broad definition going back to 1960.

year basis, it is highly significant over periods of several years. Monetary expansion, for example, rose to a peak of 19.6 percent in 1979 from 4.6 percent in 1960 while inflation rose to 9.1 percent from 1.2 percent during the same period. After monetary expansion reached its peak, inflation continued to rise to a peak of 12.5 percent in 1981, but as monetary expansion continued to fall, so, eventually, did inflation.

The same sort of correlation between monetary expansion and inflation has been found in many other countries and in many different historical circumstances. These facts can be summarized in the following historical generalization:

> *Over periods as short as one or two years, inflation and monetary expansion are not closely correlated. But whenever a country has experienced severe inflation over several years, it also has had a rate of monetary expansion significantly in excess of the rate of growth of real output, on average, for several years.*

Table 2 also shows a connection between monetary expansion and real output growth. Although the gradual rise in monetary expansion during the 1960s and 1970s did not coincide with any rise in real output growth, the abrupt monetary deceleration that started in early 1980 accompanied the most severe recession in Canadian postwar history. The year (1982) in which most of that monetary deceleration occurred was also the year of the biggest drop (4.4 percent) in real output since 1933.

This illustrates another important historical generalization, which, thanks to the historical and statistical research of monetarist economists,[2] can be stated as follows:

> *Over long periods of time, the rate of real output growth and the rate of monetary expansion are not correlated. But the most severe economic downturns, like those of the 1930s and 1980s, invariably are accompanied or immediately preceded by a sharp reduction in the rate of monetary expansion below that which has prevailed for the previous few years.*

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[2]See, for example, Phillip Cagan, *Determinants and Effects of Changes in the Stock of Money, 1875–1960* (New York: National Bureau of Economic Research, 1965); Milton Friedman and Anna Schwartz, *A Monetary History of the United States, 1867–1960* (New York: National Bureau of Economic Research, 1963); George Macesich, "The Rate of Change in Money Stock as a Leading Canadian Indicator," *Canadian Journal of Economics and Political Science* 28 (August 1962): 424–430; and Keith Hay, "Money and Cycles in Post-Confederation Canada," *Journal of Political Economy* 75 (June 1967): 263–273.

The Long-Term Effects of Monetary Policy

In the view of a large majority of economists today, these historical generalizations illustrate the long-term neutrality of money. More specifically, they illustrate that over long periods of time, the rate of monetary expansion affects neither the rate of real output growth nor the rate of unemployment.[3] Instead, what ultimately determines these variables are such factors as technological change, demographic movements, people's willingness to work, save, and take risks, government regulations and taxes that impinge on private incentives, and Canada's international terms of trade.

Neutrality implies that the Bank of Canada is limited in its ability to affect nonmonetary variables. In particular, it implies that any attempt to use monetary policy to peg the rate of unemployment or the rate of real output growth at anything other than the "natural" rate toward which it would otherwise tend is ultimately doomed to failure. Influencing rates of real output and employment growth are not feasible objectives of monetary policy.

The first historical generalization suggests that while monetary expansion may have no long-term effect on real output growth, it does have a long-term effect on inflation. This is another implication of neutrality. More specifically, neutrality implies that in the long term, the rate of inflation will be approximately equal to the excess rate of monetary expansion — that is, approximately equal to the difference between the rate of monetary expansion and the rate of growth of real output. An increase in monetary expansion will have no effect on the rate of real output growth and, hence, ultimately will increase the rate of inflation. Similarly, any decrease in monetary expansion ultimately will reduce inflation. The only policy that will deliver zero inflation in the long term is one that sets the rate of monetary expansion equal to the long-term rate of real output growth.

This relationship between excess monetary expansion and inflation can be explained by the quantity theory of money. According to this theory, the relationship arises from the interaction between the supply and demand for real money balances.

The supply of real money balances is defined as the nominal supply of money divided by the price level. It is a measure of the real purchasing power provided by the existing quantity of money.

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[3]To be precise, this proposition is what monetary economists call "superneutrality", rather than neutrality, because it refers to the effects of changing the rate of growth, rather than the level, of the money supply. Recent monetary theory offers reasons to believe that increasing the rate of growth of money can have some real long-term effects. But not many economists believe that those real effects include reducing the rate of unemployment or increasing the rate of growth of real output.

The demand for real money balances is the amount of purchasing power that people find most convenient to hold in the form of money. Over short intervals of time, this demand may be influenced by many factors and is hard to predict. But over periods as long as a year or more, there is a great deal of evidence[4] to support the view that the demand for money depends mainly on two measurable factors: the scale of transactions for which money is used, usually measured by the level of real output or real income; and the opportunity cost of holding money, usually measured by the level of interest rates.

In the long term, the demand for real balances grows as the scale of transactions grows; the growth rate of the demand for money is approximately the same as the growth rate of real output.[5] This is why the Bank of Canada can allow the money supply to expand at the same rate as real output without causing inflation. If output and the demand for real balances were growing at a steady 3 percent every year, people willingly would hold 3 percent more money each year. A 3 percent annual increase in the money supply would be just sufficient to meet the increase in demand without causing any *excess* supply and, hence, without generating any inflationary pressure.

Now suppose that, under the same circumstances, the Bank of Canada allowed the money supply to expand at a 10 percent annual rate. Then inflation eventually would have to rise to 7 percent. To see why, suppose, on the contrary, that inflation stayed fixed at a lower rate, say 2 percent. Then every year, people would find themselves holding 8 percent more money in real terms — 10 percent more dollars, minus 2 percent for inflation — although their demand had risen only by 3 percent. Their efforts to spend their excess cash eventually would generate an excess demand for goods and services, which, in turn, would exert upward pressure on the rate of inflation. As long as inflation stayed below 7 percent, this excess supply of real money balances would continue to grow, and the upward pressure on inflation would continue to mount.

The main implication of this discussion for monetary policy is that the Bank of Canada could seek the elimination of inflation, or perhaps the achievement of some small but still positive rate of inflation, as a long-term goal. The way to achieve that goal is to ensure that the rate of monetary expansion does not rise significantly, for extended periods of time, above the long-term rate of growth of real output.

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[4]The most comprehensive available summary and analysis of this evidence is contained in David E. W. Laidler, *The Demand for Money*, 3rd ed. (New York: Harper & Row), 1985.

[5]As Figure 3 (in Chapter 3) illustrates, this approximation is a very close one for M2 in Canada.

Another important implication is that the connection between excess monetary growth and inflation depends on the existence of a stable demand-for-money function — that is, a stable relationship between the demand for money and its principal determinants: real output and the rate of interest. Returning to the earlier, hypothetical example, suppose that instead of rising steadily with real output, the demand for real balances was falling because of, say, changes in banking technology that allowed people to conduct a growing volume of transactions while holding a diminishing amount of money. Then even a three percent rate of monetary expansion would be excessive, and the Bank would not be able to avoid inflation by following the simple rule suggested by the first historical generalization.

The important issue of the stability of the demand-for-money function is addressed in detail in Chapter 3, but some of the results of that analysis can be anticipated here. The historical connection between excess monetary growth and inflation is so well established, and so easily comprehended with basic economic theory, that it would be foolish to believe without very strong counterevidence that recent events have made the connection obsolete. In other words, the weight of historical evidence supports a presumption that the long-term demand function for broadly defined money is stable. Recent experience in Canada, rather than giving reason to doubt that presumption, has strengthened it. The slowdown in inflation following the monetary deceleration that began in 1980 is one more example of the long-standing historical connection between excess monetary growth and inflation.

The Short-Term Effects of Monetary Policy

Money is not neutral in the short term. A sudden reduction in the rate of monetary expansion will not immediately bring about a point-for-point reduction in the rate of inflation with no change in real output. Instead, the immediate effect will be to reduce real output below its trend path with relatively little change in the rate of inflation.

Why inflation should be slow to adjust to a fall in monetary expansion is not fully understood. It is explained partly by the fact that many contractual wages and administered prices are not very responsive to market signals of excess supply and demand. But this is not all there is to it. Inflation appears to depend not only on the current state of the economy but also on its own past behavior. In other words, inflation has a great deal of inertia. Once it gets going, a lot of excess capacity is needed to stop it. By the same token, once inflation is stopped, a great deal of excess spending is needed to get it going again.

Economists' lack of complete understanding of the inflation process seems to center on this inertial aspect. Some see it as a catch-up phenome-

non, the result of the coordination problem that arises when workers and firms base their demands not only on conditions in their own industry but also on the wages or prices that have recently been set in other sectors of the economy. According to this view, inflation can keep going in the absence of excess demand because some people keep raising their wages and prices to catch up with the recent increases in other wages and prices.

Other economists see the inertia of inflation as an expectational phenomenon. According to this view, the degree to which agents in any market raise their wages or prices depends on the rate at which they expect other wages or prices in the economy to rise. Inflation thus has a life of its own: once people begin to anticipate persistent inflation, it becomes a self-fulfilling expectation. Even when there is no excess demand, prices keep rising because people expect them to.

There is considerable disagreement among economists on how people form inflation expectations. Some think that people look to the past to discover trends in the rate of inflation and then use these trends to predict what inflation will be in the future. Others think that people form inflation expectations by rationally anticipating the future. Nevertheless, there seems to be general agreement that, however they are formed, inflation expectations are slow to adjust. Even if these expectations are completely forward looking, they cannot be changed, for example, merely by the Bank of Canada announcing that it is embarking on a noninflationary policy. People must first see the announcement as credible before they can be expected to believe it. And a credible announcement may be impossible, especially if it is not accompanied by appropriate changes in monetary expansion and a consistent fiscal policy. In the absence of a credible announcement, the only way to lead people to adjust their rational anticipations of monetary policy is to show them that the announced policies are, in fact, being carried out. This demonstration process plausibly can take several years to accomplish.

My own reading of the evidence suggests that the inertia of inflation is not so much a forward-looking, expectational phenomenon as it is a catch-up phenomenon. Moreover, to the extent that expectations of inflation have a direct effect on the course of inflation, those expectations probably do not focus on monetary policy. Most Canadians simply do not have a firm belief that monetary policy is the primary determinant of the rate of inflation. Even those who hold such a belief do not have anything approaching the sort of detailed quantitative knowledge concerning the connection between monetary policy and inflation that it would take to make accurate, short-term predictions of inflation based on the future course of monetary policy. Certainly no one I know has such knowledge. Thus, even if firms and workers were able to predict

accurately the future course of monetary policy, it is unlikely that many would pay much attention to those predictions when setting their prices and wages.

Because monetary deceleration does not influence inflation in the short term, it must, by definition, change the growth of real money balances. Thus, if one starts from a position in which the supply and demand for real money balances are equal, a deceleration opens up a gap between supply and demand.

This real money gap depresses the growth of aggregate spending, for two reasons.[6] First, interest rates rise when people try to sell interest-earning assets or go further into debt to make up for the shortage of cash. What matters for determining aggregate spending is the level of real interest rates, which are measured by subtracting the expected rate of inflation from the corresponding nominal interest rates. Real interest rates represent the expected real cost of borrowing, after allowing for the beneficial effect that inflation is expected to confer on borrowers by eroding the real value of their debt. A sudden monetary deceleration that raises nominal interest rates is unlikely to affect people's inflation expectations; therefore, it will probably raise real interest rates as well.

Second, the shortage of money causes a general shortage of liquidity. Some people find that loans are not only more costly but also harder to obtain. Others find themselves holding fewer short-term liquid assets that can be sold at short notice, at small inconvenience, for a predictable price. A greater fraction of people's wealth will be in illiquid form — that is, in the form of long-term financial assets, consumer durables, human capital, or other assets that are costly or even impossible to sell for a price close to the value attached to them by the seller.

As spending growth declines, firms cut back on production plans. Eventually, they also cut back on hiring or even begin laying off workers. Thus, both real output and employment growth fall.

Because monetary policy affects real activity in the short term, one of its feasible objectives is the short-term stabilization of real output or employment. Monetary policy potentially can be used to raise real output growth when it would otherwise be too low.

The historical connection between monetary decelerations and economic downturns shows that, in fact, monetary policy has not dampened the worst downturns but amplified them, or perhaps even initiated them. The same is true if one looks at less dramatic business-cycle movements. On the whole, the rate of monetary expansion tends to be procyclical — higher during the expansion phase of the cycle than during the recession. Thus, monetary policy, both in Canada and elsewhere, has tended,

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[6] A third reason, having to do with the exchange rate, is discussed later in this section.

perversely, to stimulate output when it is high and to depress it when it is low.[7]

Why have central banks acted this way? The most plausible answer is that as regulators of a country's financial system, central banks place a great deal of importance on maintaining "orderly" financial markets, or more specifically, on stabilizing fluctuations in interest rates. They do this by "leaning against the wind" — that is, by increasing the rate of monetary expansion when interest rates are above normal so as to keep them from rising further, and by reducing the rate of monetary expansion when interest rates are low.

Leaning against the wind stabilizes interest rates, but it destabilizes real output. This is because a downturn is almost always accompanied by a decrease in the demand for credit, which tends to bring interest rates down. And leaning against the wind requires central banks to reduce the rate of monetary expansion — to permit a monetary deceleration that reinforces the downturn.

It follows that if the Bank of Canada had tried to stabilize the monetary expansion rate rather than interest rates, then major economic downturns would have been less severe and the level of real economic activity would have been more stable. This is one of the most important lessons of monetary history.

This analysis would make no sense if the demand-for-money function were unstable. If people unexpectedly decided to hold more money, for example, the effect on real output would be like that of a monetary deceleration. An excess demand for money would arise, which would depress aggregate spending. Under those circumstances, it would actually make sense to stabilize interest rates. This is because the excess demand for money, as we have seen, would tend to raise interest rates. And a central bank that was leaning against the wind would respond by raising the rate of monetary expansion, thereby tending to offset the contractionary effect of the original shock.

If it existed on a large scale, instability in the demand function for broadly defined money could be very important. But it has not been a major factor in the Canadian business cycle. If it had, interest rates would have risen during many recessions, under the pressure of an increased demand for money, and the rate of monetary expansion also would have risen,

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[7]The fact that most of the change in money over the business cycle is a change in bank deposits means that the procyclical behavior of monetary expansion reflects the behavior of the private banking system as well as the conduct of monetary policy. Thus, the facts cited here do not demonstrate that the Bank of Canada has tended to set its instruments (interest rates and the monetary base) at more restrictive settings in recession than in boom. It remains true that during most economic downturns, the Bank could have set its instruments at sufficiently expansionary settings to have avoided the fall in the rate of monetary expansion.

as a result of the Bank's efforts to resist the rise in interest rates. Instead, both interest rates and monetary expansion almost always fall in recessions. Once more, the historical record supports a presumption that the demand function for broadly defined money is stable.

Open-Economy Considerations

Taking into account the openness of the Canadian economy to international trade and capital flows does not change the basic messages of the previous section, but it does add important details.

Perhaps the most important result of the following analysis is that if monetary policy is to pursue the long-term objective of low inflation and the short-term objective of stable real activity, then the value of the Canadian dollar should be allowed to fluctuate on foreign currency markets.

In the long term, the strength of the Canadian dollar is determined primarily by the amount of inflation Canada experiences compared with the rest of the world: the more inflation Canada has, relative to other countries, the weaker the Canadian dollar will be. This relationship is explained by the theory of purchasing-power parity, according to which, the rate of depreciation of the Canadian dollar in the long term will equal the difference between Canada's rate of inflation and the average rate of inflation of Canada's major international trading partners and competitors.

The reason for this relationship is not hard to see. Suppose other countries experience a 3 percent inflation rate while Canada has a 10 percent inflation rate. Then the currencies of the other countries lose purchasing power over goods at the rate of 3 percent per year while the Canadian dollar loses purchasing power at a 10 percent rate. The 7 percent depreciation of the Canadian dollar just reflects the fact that it is losing purchasing power that much faster than the other currencies. By the same token, purchasing-power parity implies that if Canada maintains a rate of inflation 7 percent lower than that of the rest of the world, then the Canadian dollar eventually will appreciate at a 7 percent rate.

The importance of this for monetary policy is that if inflation is to be avoided in the long term, Canada must have a flexible exchange rate, unless by coincidence Canada's major trading partners and competitors also have a zero rate of inflation. If Canada has no inflation and the rest of the world has a 5 percent inflation rate, then the Canadian dollar must eventually appreciate at a 5 percent rate. Canada might try for some time to keep its exchange rate fixed and thus avoid the 5 percent appreciation. The Bank of Canada then would have to intervene in foreign currency markets, selling Canadian dollars to keep the exchange rate down. But this intervention would increase the supply of Canadian dollars in circulation; the monetary expansion, if continued, eventually would cause

inflation. Thus, the Bank would have to decide at some point either to abandon the fixed rate or to accept inflation.

The high degree to which international capital markets have become integrated in recent years puts another constraint on monetary policy. Specifically, it rules out made-in-Canada interest rates. For all but perhaps very short-term assets, Canadian interest rates are dominated by interest parity: Canadian interest rates equal U.S. interest rates minus the rate at which the Canadian dollar is expected to appreciate with respect to the U.S. dollar (or plus the expected rate of depreciation).[8] If Canadian interest rates were any lower than this, investors would expect to earn a higher rate of return by investing abroad, and there would be a massive flight of capital.

Interest parity implies that in the long term, the Bank has virtually no control over the level of real interest rates. For example, if Canada's inflation rate was 2 percent lower than that of the United States, then, by purchasing-power parity, the expected rate of appreciation would be 2 percent; by interest parity, Canadian nominal interest rates would be 2 percent lower than those in the United States. But this means that Canada would have the same real interest rates as the United States, since Canada's 2 percent lower interest rates would be just offset in real terms by its 2 percent lower inflation.

In the short term, Canada's exchange rate is not determined by purchasing-power parity, which is strictly a long-term relationship. Instead, it is governed primarily by international capital flows — more specifically, by the two factors that enter into the interest-parity theory: the differential between Canada's interest rates and those in the rest of the world, and the state of expectations concerning the future value of the Canadian dollar.

If foreign interest rates were to rise and Canada's did not, the interest differential would fall and people would have a strong incentive to sell their Canadian dollar assets in order to acquire foreign assets. The resulting excess supply of Canadian dollars on foreign currency markets would drive down the value of the dollar. Similarly, if people began to lose confidence in the future value of the dollar, they would begin to sell it on foreign currency markets, causing the dollar to depreciate — the expectation of depreciation would be self-fulfilling.

Next, in an open economy, the short-term effects of monetary policy work not just through real interest rates and the supply of liquidity but also through the real exchange rate. Canada's real exchange rate is the

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[8]The importance of interest parity for all but perhaps very short-term assets was underlined in a study conducted for the Macdonald Commission by a group of researchers at the Bank of Canada. See Paul Boothe et al., ***International Asset Substitutability: Theory and Evidence for Canada*** (Ottawa: Bank of Canada, February 1985).

price of Canadian goods relative to foreign goods. It is increased whenever the Canadian price level rises relative to the price level in the rest of the world. It can also be increased by an appreciation of the nominal exchange rate — the price of the Canadian dollar relative to foreign currencies — because if the Canadian dollar becomes more expensive to foreigners, then so do Canadian goods.

More specifically, a monetary deceleration that tends to raise domestic interest rates raises the nominal exchange rate and, hence, tends to raise the real exchange rate. But the increase in the real exchange rate depresses the aggregate demand for Canadian exports, which are now relatively more expensive, and stimulates the demand for imports. Through both of these effects, it depresses the growth of aggregate demand for Canadian goods and services, resulting in slower growth of output and employment.

The extent to which the real effect of the deceleration works through interest rates or through the exchange rate depends on what happens to the expected rate of depreciation of the Canadian dollar. Suppose, for example, that people always believe the exchange rate is going to stay wherever it is. This is the case known as "static expectations". The expected rate of depreciation is then always zero and remains unchanged by the monetary deceleration. As long as foreign interest rates remain the same, interest parity requires Canadian interest rates to remain unchanged. All of the effects work through the exchange rate.

If, on the other hand, people's expectations are "inelastic" — if observing an appreciation of the dollar leads them to believe that the exchange rate must come down again — then the rate of interest rises together with the exchange rate to the point where people begin to expect a depreciation at a rate just equal to the interest differential. In this case, the effects work through both the interest rate and the exchange rate.

Exactly how people form their expectations of the future exchange rate is impossible to tell. Some certainly try to anticipate the effects of future monetary and fiscal policies and other fundamental factors. Others try to anticipate "market sentiment". Still others look for trends in the past value of the exchange rate. Inelastic expectations will prevail, however, if many people have in mind a theory of how the "equilibrium" exchange rate is determined — whether the theory is correct or not — as long as any change in the current exchange rate, starting from a level that was thought to be an "equilibrium", tends to make people expect the rate to return to its original level. Static expectations, or even elastic expectations — according to which, appreciation causes the expectation of a further appreciation — require people to revise their view of the equilibrium rate every time they see a change in the actual rate.

The monetary deceleration itself also may have a direct effect on people's perception of the "equilibrium" exchange rate. If they see a tight policy being pursued, for example, they may revise upward their expectation of the future exchange rate on the grounds that, in the long term, tight money will reduce inflation and, hence, cause appreciation.

However expectations are formed, there is no reason to doubt that sudden changes in the rate of monetary expansion have important short-term effects on output and employment growth. All that these expectations influence is the extent to which the short-term effects work through the exchange rate rather than through interest rates. Keeping a stable rate of monetary expansion thus helps to stabilize output and employment growth by avoiding the procyclical monetary policies of the past, even though Canada is very open to international flows of capital and goods.

If the Bank of Canada wishes to stabilize the rate of monetary expansion, it has to allow the Canadian exchange rate to fluctuate. Fixing the exchange rate causes the rate of monetary expansion and, hence, the level of real activity to be buffeted by international and domestic developments.

To see why this is so, suppose, for example, that world interest rates rise suddenly and that the Bank keeps the Canadian exchange rate fixed. To avoid depreciation, the Bank has to force up interest rates by bringing about a monetary deceleration, which then reduces real output growth.

To take another example, suppose that there is a slowdown in aggregate spending in Canada. This tends to decrease the demand for credit and interest rates start to fall. In order to keep the Canadian dollar from depreciating, the Bank has to counteract that fall in interest rates. Specifically, it has to bring about a monetary deceleration, which then amplifies the initial slowdown in spending.

In both of these examples, the attempt to stabilize the exchange rate destabilizes the rate of monetary expansion and, hence, the growth of real economic activity. If the Bank lets the Canadian dollar depreciate instead, monetary expansion need not fall and the growth of real output is more stable.

The fact that steady monetary growth requires a fluctuating exchange rate provides another explanation for why monetary expansion has not, in fact, been kept steady. For much of its history, Canada has been on a fixed exchange rate. And even with a flexible exchange rate, the Bank has attempted to dampen fluctuations in that rate, as it has dampened fluctuations in interest rates, out of a concern for maintaining orderly financial markets.

Another implication of these open-economy considerations is that an expansionary monetary policy can have a direct effect on inflation over and above the effect that works through aggregate spending. By causing

the Canadian dollar to depreciate, it automatically raises the Canadian dollar price of any good whose price is determined on international markets. Even goods that are marketed only in Canada may be affected directly if their production requires the use of imported raw materials or if they compete directly with imported goods.

The size of this direct effect of depreciation is not very well determined empirically. Although one-third or so of the bundle the Consumer Price Index (CPI) evaluates is made up of imported goods, that does not mean that a three percentage point depreciation causes at least a one percentage point rise in the CPI. In the short term, the effects may be borne largely by dealers who import and distribute the goods or by foreign producers. This is especially true for goods such as automobiles, whose international trade is subject to so many restrictions that the law of one international price does not hold even approximately. Furthermore, while a once-and-for-all depreciation may induce a once-and-for-all rise in the Canadian price level, that means only a temporary, not a permanent, increase in the Canadian inflation rate. The increase in inflation may be spread out over several years; in the long term, however, the rate of inflation is determined not by movements in the exchange rate but by excess monetary expansion.

Adaptive Monetary Control

On the basis of the above considerations, the Bank of Canada should adopt the principle of Adaptive Monetary Control, which can be stated as follows:

> ***The supply of money, broadly defined, rarely should be permitted to deviate for a period longer than a few months outside a narrow band around a target that grows at approximately the same rate as capacity output.***

If the Bank were to follow this principle, it would be doing as much as possible to achieve two fundamental goals: low inflation and stable real growth. By eliminating excess monetary expansion, the Bank would guard against high rates of inflation in the long term. By reducing the short-term variability of monetary expansion, it would avoid past procyclical monetary policies that have amplified rather than dampened business-cycle fluctuations.

This strategic principle is not a complete prescription for monetary policy. It leaves unspecified such questions as how to control monetary expansion, which definition of money to use, how wide to set the band, how often is "rarely", and how the Bank should conduct its operations

during months when the money supply is outside its target band. Many of these important technical questions are dealt with in the next chapter.

A corollary to the principle of Adaptive Monetary Control needs to be underlined. In order to stick close to a monetary target, the Bank must be prepared to allow interest rates and the value of the Canadian dollar to fluctuate more freely than in the past. Adaptive Monetary Control is not possible if the Bank tries to stabilize either interest rates or the exchange rate over periods any longer than perhaps a few weeks.

It is worth emphasizing in this connection that interest-rate and exchange-rate fluctuations are not just necessary evils of Adaptive Monetary Control. They are an essential part of the mechanism whereby the policy helps to stabilize output and employment. When there is a decline, for example, in the level of investment demand, the demand for credit falls. This causes domestic interest rates to fall, bringing the exchange rate down with them. The fall in interest rates helps persuade some people to undertake new investment projects to replace those that have just been dropped. The fall in the exchange rate helps persuade people to buy more Canadian goods. Both of these effects work to offset the fall in aggregate spending. Leaning against the wind inhibits this stabilizing mechanism. Adaptive Monetary Control lets it work.

Rules versus Discretion

The term "adaptive" is used in describing the above principle for two reasons. First, the money supply is not a direct instrument of the Bank. The Bank can influence the rate of monetary expansion by means of the various operations described above, but it cannot guarantee that any target will be hit exactly on a month-to-month or even quarter-to-quarter basis. The exact quantitative relationship between the Bank's operations and the rate of monetary expansion is not easily predictable. Furthermore, any change in the Bank's policy is likely to cause that relationship to change in unpredictable ways.[9] Thus, there are no simple formulas that the Bank can use to keep the money supply on target. It must rely to a large extent on trial and error — that is, set the instruments of monetary policy at the values that seem most likely in light of all available information to hit the target, but then be prepared to adapt the settings when the target is missed.

The second reason for using the term "adaptive" is to stress the need for the Bank to use its discretion in coping with unexpected developments.

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[9]This is an implication of the well-known "Lucas critique", first presented by Robert E. Lucas, Jr. See "Econometric Policy Evaluation: A Critique," in Karl Brunner and Allan H. Meltzer, eds., *The Phillips Curve and Labor Markets*, Carnegie-Rochester Conference Series on Public Policy no. 1 (Amsterdam: North-Holland, 1976), pp. 19–46.

In deciding when to allow sustained deviations from the target, which monetary aggregates to use, how vigorously to correct any temporary departure from the target, and perhaps even in deciding from time to time that the target path needs to be revised, the Bank must adapt to changing circumstances.

Now, Adaptive Monetary Control embodies a monetary rule: to keep the money supply growing at a rate equal to the long-term growth rate of the economy. Such rules are often advocated on the grounds that they limit the central bank's use of discretion and that those who make important decisions for the rest of us should be constrained by the constitutional rules that the rest of us have agreed on. It has also been argued that substituting rules for discretion would have a direct impact on inflation by changing people's inflationary expectations. People might not believe that the Bank was serious in its fight against inflation if it could abandon that fight at any time, but they might do so if the law required the Bank to follow a monetary rule that guarantees long-term price stability.

In my view, however, it is fundamentally wrong to see a monetary rule as removing the need for discretion. Discretion will always be needed because it is impossible to write a rule that (a) completely specifies how the Bank should set its instruments under all circumstances, and (b) is appropriate in all circumstances. Whatever the rule, there will always be unexpected developments that call for exceptions to be made. The Bank must use its discretion in judging when exceptions should be made, when the rule should be changed, and what to do at such times.

To take an extreme but relevant example, something outside the normal rule of steady monetary growth obviously is called for in the midst of the worst recession in half a century. Similarly, if inflation started to develop and persisted for several years even though the monetary rule was being followed, common sense would dictate that the Bank revise downward its estimate of the appropriate growth rate of broadly defined money. Furthermore, because the weekly and even monthly demand for money is likely to be erratic, there is a presumption that short-term departures from the long-term path be permitted.

The purpose of a monetary rule is thus not to eliminate discretion but to guide policy under normal circumstances. Adaptive Monetary Control requires that the money supply normally be controlled according to this rule, but it also needs a central bank that can adapt intelligently to abnormal events.

It might be argued that even though the rule is not a complete substitute for discretion, the Bank ought to announce it publicly and commit itself to obeying the rule under normal circumstances. Perhaps the Bank should be obliged publicly to justify any deviations from the rule. This

strategy of commitment might make the rule more credible and, therefore, might avoid inflationary expectations. Relatively little would be gained by such a strategy, however, if, as I believe, people's expectations of the future course of monetary policy do not have much influence over the course of inflation.

Optimal Control of the Economy?

This study has argued that Adaptive Monetary Control can play an important role in stabilizing real activity. But might there be a better strategy? Might not a policy of raising the money supply above its long-term path during recessions and lowering it during the peak of the business cycle do even better than following the principle of Adaptive Monetary Control?

In principle, such a strategy has merit. But in practice, the Bank's ability to go beyond the rule of adaptive control is limited, for two major reasons. The first has to do with the limitations of economic science. Because of the Bank's limited ability from month to month to tell exactly where the economy is in relation to its long-term equilibrium position, it is hard to know when to exceed the rule and when to fall short, and by how much. Similarly, the ability to predict the size and timing of the real effects of monetary policy is limited. Thus, even when the Bank knows that aggregate spending is lower than it should be, there is always the danger that an expansionary monetary policy will not start to exert its influence for several months. By that time, the economy already may have pulled out of its recession and the monetary stimulus may add to unwanted inflationary pressure.

This is not to say that the Bank should simply pay no attention to the current state of the business cycle; the dangers of acting should be weighed against the costs of not acting. But uncertainty about the state of the economy and about its reaction to changes in the rate of monetary expansion suggests that the Bank normally should keep those changes small.

The second reason for doubting the Bank's ability to improve much on an adaptive monetary rule is that, under present institutional arrangements, it cannot achieve precise month-to-month — and probably not even quarter-to-quarter — control of the rate of expansion of broadly defined money. Whatever instruments the Bank uses to control the money supply, there will be departures from the target. If these departures are allowed to persist — or worse, to grow — for several months, several quarters will have passed by the time monetary expansion is brought under control, and the damage will have been done. The Bank thus would have to devote most of its efforts toward keeping the money supply on target.

To put it slightly differently, the Bank normally should react vigorously to departures of the money supply from the long-term target in order to maintain a long-term anchor to nominal spending. If monetary expansion is allowed to accelerate or to decelerate, a cumulative movement in aggregate spending can gather momentum. Cumulative increases in spending can set in motion an inertial inflationary process. Cumulative decreases can instigate a prolonged recession.

Nominal-Income Targeting

The Royal Commission on the Economic Union and Development Prospects for Canada (Macdonald Commission), following similar proposals of several prominent economists,[10] recently recommended that monetary policy attempt to hit not a monetary target but a nominal-income target — that the Bank attempt to keep nominal income from deviating too much from a target.[11] Such a policy would have the same virtues as monetary targeting: namely, that it would provide an anchor to nominal spending and would help to stabilize real output and employment in the short term.

The proponents of nominal-income targeting argue that it would even be superior to monetary targeting because nominal income is more closely correlated with the ultimate objectives of monetary policy than is the money supply. More specifically, they argue that the ultimate purpose of stabilizing the money supply around a target is to stabilize aggregate spending around its ideal target. Nominal income is, in fact, a measure of aggregate spending. Thus, monetary targeting is just a means of attempting to stabilize nominal income. Instead of attempting this indirect kind of nominal-income targeting, why not do it directly?

In practice, nominal-income targeting and monetary targeting would be similar policies. Under one policy, the Bank would adopt a more restrictive stance when nominal income was above target; under the other, it would do the same when the money supply was above target. But these two circumstances often would coincide because nominal income and the money supply (broadly defined) are closely correlated. As Figure 3 (in Chapter 3) shows, the ratio of nominal income to M2 — that is, the income velocity of M2 — has not been subject to large year-to-year fluctuations.

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[10]See, for example, Robert J. Gordon, "The Conduct of Domestic Monetary Policy," in Albert Ando et al., eds., *Monetary Policy in Our Times* (Cambridge, Mass.: MIT Press, 1985), pp. 45–81; and James Tobin, "Monetary Policy: Rules, Targets, and Shocks," *Journal of Money, Credit, and Banking* 15 (November 1983): 506–518.

[11]Nominal income in this context usually means the current-dollar value of GNP. Gordon ("The Conduct of Domestic Monetary Policy") recommends a target for final sales — that is, current-dollar GNP minus inventory investment.

To the extent that the two policies differ, monetary targeting is generally preferable, for two reasons. First, the Bank has a better chance of stabilizing the money supply than stabilizing nominal income. Whichever variable it tried to control, it would have to begin by relying on trial and error in the hope that it would learn enough from its errors to hit on a technique that worked and that the errors would not be too costly. These hopes would be more justified if the Bank were trying to control the money supply than if it were trying to control nominal income. The money supply is affected more directly by the Bank's primary instruments — the monetary base and interest rates — than is nominal income. Learning to control nominal income involves learning to control the whole economy. The price level and real output have a dynamic behavior that no one can predict accurately. Learning to counteract that dynamic behavior precisely with monetary policy would be a heroic task. In attempting it, there is a real danger that the Bank would make mistakes on such a scale that nominal income would end up being destabilized rather than stabilized.

To take a concrete example, suppose that nominal income rose above target while the money supply fell below. Under these circumstances, nominal-income targeting would lead the Bank to adopt a more restrictive stance, which would cause the money supply to fall further below target. The danger is that nominal income might have been about to fall anyway, in which case the monetary contraction would serve to aggravate the coming recession.

Of course, there would also be a danger in these circumstances if the Bank adopted the more expansionary stance called for by monetary targeting. For example, there might have been a downward shift in the demand function for money. Nominal income might have been continuing to rise, in which case the monetary expansion would add further to unwanted inflationary pressure. There are dangers in any course of action, and the Bank has to assess the situation in the light of all available information. But in evaluating this information, the Bank should bear in mind that getting the money supply back on target is a safeguard against the destabilizing policies of the past. Monetary targeting, even if it does not turn out to have been the best of all possible courses of action, is unlikely to lead to disaster. Allowing a monetary contraction to continue, on the other hand, could contribute to a serious economic downturn, as it has in the past.

The second reason for preferring monetary targeting to nominal-income targeting is more political than economic. Under monetary targeting, the Bank can justify raising interest rates by pointing to the need to keep monetary expansion under control, in order to keep inflationary pressure from building up. This is not always an easy task, especially if there already

is considerable unemployment, because there is always a popular demand for lower interest rates. But it is probably an easier task than trying to justify higher interest rates because there is too much income or too much spending. To justify its policies this way, the Bank would be assuming responsibility for a variable that is beyond the scope of the banking system. Could the Bank persuade Canadians that it has the authority to assume such responsibility? How much public demand would there be to put control of incomes and spending in the hands of the people's elected representatives rather than in the Bank's? Politicizing the conduct of monetary policy could result in short-term political objectives replacing the valid economic objectives of policy.

Despite these arguments against nominal-income targeting, it remains important for the Bank to watch out for the possibility of long-term changes in velocity that could lead to the gradual buildup of inflationary pressure even under a regime of monetary targeting. If there are discernible trends in velocity, the target should be adjusted to take them into account. For example, if capacity output is rising at a trend rate of 3 percent and velocity is rising at a 2 percent rate, then the money supply target should grow at only a 1 percent rate. Similarly, if discrete, permanent shifts in velocity can be detected, then the base from which the target grows should be adjusted accordingly.

The Problem of Transition

There is one set of circumstances, particularly relevant to the evaluation of monetary policy conducted later in this study, that clearly calls for an exception to the rule of steady monetary growth. This is where the Bank attempts to bring about a transition to a lower rate of inflation.[12]

Suppose, for example, that the economy has adapted to a 10 percent rate of inflation and that the Bank decides to reduce the rate to zero. To execute this decision, the Bank must lower the rate of monetary expansion by 10 percentage points. Also suppose that the long-term demand for money has been growing, and continues to grow, at 3 percent. Then the rate of monetary expansion must fall to 3 percent from 13 percent.

Because inflation has so much inertia, it responds to the monetary deceleration only with a long lag. The real quantity of money, which is just the nominal quantity divided by the price level, then falls below the growth path it has been following, for the simple reason that the nominal quantity slows down before the price level does. This is illustrated in Figure 1, where it is assumed that the money supply starts to decelerate at time t_0 and reaches its new 3 percent growth path at t_1. The real quantity of money in this illustration falls below the original long-term path, and even falls in absolute terms before starting to pick up at time t_2.

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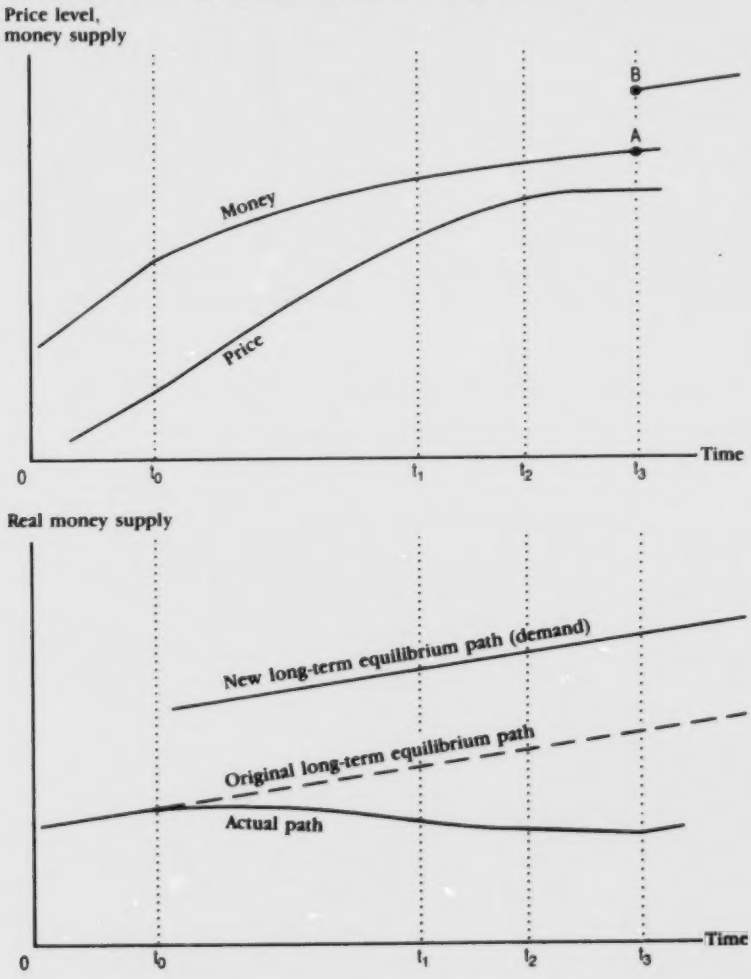
[12]The need for such an exception is known in the technical literature as the "re-entry" problem.

Figure 1

The Problem of Transition from a High Rate of Inflation



Not only does the real money supply fall below its equilibrium path, but the equilibrium path itself shifts up. (The equilibrium path is just the path of the long-term demand for real money balances — that is, the demand for money that would exist if real output were at its capacity level and if the nominal rate of interest had fully adjusted to the underlying rate of inflation.) The upward shift in this equilibrium path occurs because the fall in inflation ultimately reduces nominal interest rates and, hence, reduces the opportunity cost of holding money. The long-term demand for real money continues to grow at 3 percent because of the growth in capacity output, but at each date it is greater than it would have been because of lower interest rates.[13]

This combination of a slowdown in the real supply of money and an upward shift in the long-term real demand means that there is a long-term excess demand for money during the transition. If the economy is going to return to its equilibrium growth path, real balances have to rise by enough to eliminate the excess demand. Until this happens, the deficiency of real money balances keeps real output depressed.

If the Bank keeps the rate of monetary expansion at 3 percent, then in order for real balances to get back on their equilibrium path, the inflation rate has to do more than just fall from 10 percent to zero; it has to fall below zero. This is because if inflation falls to zero at, say, time t_3 and stays there without ever becoming negative, then real balances grow from then on at 3 percent — 3 percent nominal money growth minus the zero inflation. But this is not fast enough to reduce the gap between the actual path of real money and the new equilibrium path. Both paths grow at 3 percent and the distance between them is not eliminated. To eliminate the gap and complete the transition, the economy has to go through a period of deflation.

It is easy to see how this situation could call for an exception to the normal 3 percent rule. Experience has shown that it takes a massive recession to get inflation down even to 3 or 4 percent after several years in double digits. To get it down below zero by enough, and for long enough, to eliminate a substantial long-term excess demand for money almost certainly would produce such a prolonged depression that an exceptionally expansionary monetary policy obviously would be in order.

In short, making the transition from an established high rate of inflation requires exactly the kind of monetary deceleration that characterizes the worst downturns — the sort of deceleration that a monetary rule is supposed to avoid. But once inflation becomes established, it is impossible to avoid a deceleration as a first step to getting on a noninfla-

[13]The slopes of the paths in Figure 1 indicate growth rates. A one-time increase in the level of a variable, followed by a return to the same growth rate as before, is represented by a parallel upward shift of its path.

tionary path. Managing this first step onto the path is an inherently different strategic objective from staying on the path: the principle of Adaptive Monetary Control provides a guide to staying on the path, not for getting on it.

Suppose, for example, that at some time between t_2 and t_3 and with a rate of inflation close to zero, the economy was in the midst of a big recession. Rather than wait for deflation to take its course, the sensible thing would be to allow a one-time rise in the nominal money supply to eliminate the long-term excess demand (from A to B in Figure 1). Having made this adjustment, the Bank then could revert to a 3 percent monetary rule, but with a target path that starts at B rather than A.

Indeed, once the rate of inflation has started to fall, and even before it has come down close to zero, the sensible policy is to allow the rate of monetary expansion to rise by enough to keep the gap between actual and equilibrium real money balances from growing too large. As long as the gap remains, inflation probably will continue on its downward course. As inflation comes down so can the rate of monetary expansion. Thus, the optimal path of monetary expansion following an initial decrease below its established trend may well involve a prolonged period during which it stays at a rate above the growth rate of capacity output. This rate is one that balances off the need to continue downward pressure on the rate of inflation against the cost in terms of lost output and employment of adding to that downward pressure.

Summary

The main principles outlined in this chapter may be summarized as follows:

- Monetary policy affects the economy mainly by altering the supply of money. The Bank of Canada affects the money supply by operations that change the size of the monetary base. The most important of these operations are the purchase of government securities, management of the federal government's cash deposits, and interventions in the foreign exchange market.

- In the long term, the rate of inflation is determined primarily by the excess rate of monetary expansion — that is, by the difference between the rate of expansion of the money supply and the rate of real output growth. In the short term, inflation is affected by the level of aggregate spending, but it also has a great deal of inertia because of the way firms and workers continually try to catch up with past wage and price increases. This inertia makes the path of inflation hard to alter by monetary policy in the short term.

- In the long term, monetary policy cannot affect the rate of real output growth, the rate of unemployment, or the real rate of interest. In the short term, it can. Monetary deceleration creates an excess demand for real money balances. This causes real interest rates to rise, the supply of liquidity to fall, and the real exchange rate to rise. All of these effects reduce aggregate spending, causing output and employment to slow down. The rate of monetary expansion has been procyclical in the past. In this sense, monetary policy has tended to destabilize real output and employment.

- The historical evidence supports a presumption that instability in the demand for broadly defined money is *not* an important factor in determining the long-term rate of inflation or in causing business-cycle fluctuations.

- In order to pursue the long-term objective of a low rate of inflation, Canada must have a flexible exchange rate. In the long term, the Canadian exchange rate is explained by the theory of purchasing-power parity. According to this theory, the rate of depreciation of the Canadian dollar equals the difference between the rate of inflation in Canada and the average rate of inflation among its major international trading partners and competitors. In the short term, the Canadian exchange rate is determined primarily by the differential between interest rates in Canada and those in the rest of the world, and by the state of expectations concerning the future value of the Canadian dollar. Any decrease in this differential or in the expected future value of the dollar tends to cause the dollar to depreciate immediately.

- The level of nominal interest rates in Canada is governed by the condition of interest parity: Canadian rates must be equal to comparable U.S. rates plus the rate at which people expect the Canadian dollar to depreciate against the U.S. dollar.

- The principle by which I judge monetary policy is one I call "Adaptive Monetary Control". It can be stated as follows:

> ***The supply of money, broadly defined, rarely should be permitted to deviate for a period longer than a few months outside a narrow band around a target that grows at approximately the same rate as capacity output.***

By following this principle, the Bank of Canada can best pursue the two goals of a low rate of inflation in the long term and a stable level

of real activity in the short term. The rule embedded in this principle is intended to guide the Bank under normal circumstances; it is not intended to substitute for the Bank's use of discretion.

- Adaptive Monetary Control is inconsistent with a policy of fixing interest rates or the exchange rate. Fluctuations in these rates are an important part of the mechanism by which the economic system stabilizes output and employment.

- Adaptive Monetary Control is preferable to nominal-income targeting because of the difficulty of learning to control nominal income and because of the possible political implications of the Bank of Canada's assuming responsibility for people's incomes.

- An exception to the principle of Adaptive Monetary Control is definitely called for in the case of a transition to a lower rate of inflation. After an initial period of monetary deceleration intended to exert downward pressure on the rate of inflation, it makes sense to have a temporary burst of monetary expansion — at a rate faster than the long-term real growth rate of the economy — to narrow the gap between the supply and demand for real money balances and, thus, to avoid an unnecessarily deep and prolonged recession.

3

Problems of Monetary Control

Canada's experience of Gradualism, as well as that of other countries under various targeting regimes, points out that there are considerable problems with monetary control. In 1982, these problems led the Bank of Canada to abandon the monetary targets that it had been using under Gradualism. Some economists have even come to believe that the whole idea of controlling monetary aggregates should be abandoned. This chapter examines these problems and argues that while there are important lessons to be learned from recent experience, the problems are not so great as to overthrow the economic arguments in favor of Adaptive Monetary Control.

The chapter begins by pointing out that the problems that led the Bank to abandon Gradualism would not necessarily apply to Adaptive Monetary Control because the two strategies are different from each other in several fundamental respects. This is followed by an examination in detail of two of the central issues that the experience of Gradualism raised: the appropriate definition of money, and instability in the demand function for money. On the first of these issues, the conclusion is that the broad aggregates (M2 or broader) are the most appropriate and that, furthermore, it is probably a mistake to focus exclusively on one single broad definition. On the second issue, it does not appear that the problem of instability in the demand function for M1 that led to the abandonment of Gradualism arose with the broader aggregates; thus, it likely would not be a drawback to Adaptive Monetary Control, which would not attempt to control as narrow an aggregate as M1.

The chapter then turns to the issue of controllability. Can broadly defined money be controlled with sufficient precision to carry out Adaptive Monetary Control? If so, which instrument should be used to control it: the rate of interest or the monetary base? Despite the unhappy U.S. experience during the 1979–82 period with a form of base control, and despite some theoretical objections raised by economists at the Bank of Canada, there seems to be no strong reason for believing that broadly defined money cannot be controlled with sufficient precision. The question of which instrument the Bank should use and by exactly what formula, however, is not one that can be answered definitively.

Gradualism and Adaptive Monetary Control

Gradualism, as implemented by the Bank of Canada in 1975, was a policy of gradually reducing the rate of growth of narrowly defined

money (M1) from the high ranges that had prevailed in the early 1970s to a range that would be consistent with long-term price stability. An important part of this policy was the announcement of target ranges for M1 growth rates.[1] The Bank hoped that by influencing people's expectations, these announcements would have a direct effect on the rate of inflation. It hoped that gradual, predictable monetary deceleration would reduce inflation while keeping at a minimum the output costs normally associated with monetary deceleration.

The Bank's 1982 *Annual Report* stated that the program had been abandoned because developments in the banking system had destabilized the demand for M1:

> The relationship between M1 and economic developments has become so distorted that M1 can no longer be taken at its face value....The combination of inflation, high interest rates, computer-based technology and competition among financial institutions has resulted in innovations in financial services that have permitted Canadians both to reduce appreciably the average size of balances they hold for making payments and to hold more of those balances in interest-earning forms not included in M1....[B]oth the process of financial innovation and the response of bank customers have been rapid and continuing. Since neither can be reliably predicted, appropriate ranges for the future growth of M1 cannot be chosen with any confidence.[2]

The question of instability in the demand for money goes to the heart of Adaptive Monetary Control. But the reasons for abandoning Gradualism, even if justifiable, do not automatically discredit Adaptive Monetary Control, because it differs from Gradualism in several important respects.

First, Gradualism was a policy for making a transition from an established high rate of inflation. In Chapter 2, it was argued that such a transition typically requires an exception to the principle of Adaptive Monetary Control, a principle that ought to guide policy under normal circumstances.

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[1]The ranges were subject to revision at the Bank's discretion. This discretion made monetary policy less predictable than if the Bank had announced a firm target path for the money supply into the indefinite future. But it was clearly understood that the revisions always would be in a downward direction and that if ever M1 escaped outside its announced range, the Bank would endeavor to bring it inside before revising the range — that is, each new target range was to begin from inside the previous range. The alternative of announcing a new target range beginning outside the previously announced range would have created the problem of "base drift" that made U.S. monetary policy in the 1970s hard to predict.

[2]Bank of Canada, *Annual Report 1982*, p. 27.

Second, Gradualism was a policy of controlling narrowly, rather than broadly, defined money. The question of the appropriate definition of money is an important one, and it is closely related to the issue of the stability of the demand for money. For this reason, it is dealt with in the next section.

Third, Gradualism emphasized the "announcement" effect of the Bank's policies on the rate of inflation through people's expectations. The effect these announcements had is questionable. It is not at all clear that the inertia of inflation is attributable primarily to forward-looking expectations. In addition, even if such expectations are important, it is doubtful whether the Bank can affect them merely by announcing its intentions to fight inflation. Some observers have criticized Gradualism for underestimating the difficulty of controlling inflation through influencing people's expectations. Whether this criticism is valid or not, it does not apply to the principle of Adaptive Monetary Control.

Fourth, under Gradualism, the Bank routinely allowed departures of the money supply from its target to persist for longer than Adaptive Monetary Control would allow. It did this on the grounds that (a) such departures were often the result of shifts in the demand for M1 and that these shifts should be accommodated, and (b) allowing the money supply to fall below target was sometimes the best response to international developments that otherwise would have led to a depreciation of the Canadian dollar.[3]

The first of these reasons for departing from the target relates to the stability of the demand for money, which is dealt with later in this chapter. The second reason can be thought of as a manifestation of the transitional nature of Gradualism. An unexpected depreciation of the Canadian dollar may not normally have a strong, predictable, or sufficiently persistent effect on the rate of inflation to warrant a departure from the normal noninflationary monetary rule. But when inflation is still in or near the double-digit range, times are not normal; it may make sense to "err on the side of lower inflation". Avoiding a depreciation requires a monetary deceleration that runs the risk of bringing on a recession, and this is why it is not normally advisable. But the risk might be worth taking when the alternative is to allow inflation to rise further into the double digits, even if only temporarily. The question of how the Bank should react to exchange-rate movements under more normal circumstances is dealt with in greater detail in Chapters 6 and 7.

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[3]Short-term departures also were allowed in response to what the Bank perceived to be temporary fluctuations in U.S. interest rates. See Gordon Thiessen, "The Canadian Experience with Monetary Targeting," in *Central Bank Views on Monetary Targeting* (New York: Federal Reserve Bank of New York, 1982), pp. 100–114. As long as these departures were indeed temporary — that is, not lasting for more than a few weeks — they did not violate the principle of Adaptive Monetary Control.

The Definition of Money

An important practical problem that any regime of monetary control must address is which of the many aggregates to control. Under Gradualism, the Bank focused on M1, a narrowly defined aggregate. The principle of Adaptive Monetary Control is phrased in terms of broadly defined money. What now follows is an analysis of why broader aggregates are preferable and which broad aggregate is best.

Table 1 (see Chapter 2) gives an idea of the range of available alternatives. These vary from the narrowest of definitions — the monetary base, which includes only the noninterest-bearing liabilities of the consolidated government sector — all the way up to M3++, which includes all depository liabilities of financial intermediaries plus the holdings by the public of such liquid assets as Canada Savings Bonds, federal government Treasury Bills, and short-term commercial paper. As Table 1 shows, there is no unique collection of financial instruments called "money" that can be sharply delineated from nonmoney financial instruments. Instead, there is a spectrum of liquid assets ranging from base money to marketable, short-term private debt.

One might think that M1 is the best alternative since it most closely represents the means of payment in the economy. But holders regard many of the items in broader definitions as close substitutes for M1. This is especially true of items such as daily interest chequable savings accounts, which are not in M1 but are as much a means of payment as are the conventional chequing accounts that M1 includes. It is also true of such items as nonchequable savings accounts. Although they cannot be used directly for making payments, their holders regard them as being available almost on demand for making payments, since the costs of transferring them into cash or into a chequing account are quite small.

The problems with controlling a subset of liquid assets for which there exist good substitutes are twofold. First, when the Bank tries to restrict aggregate spending by reducing the rate of growth of the chosen aggregate, small changes in relative yields induce offsetting changes in the rates of growth of the substitutes, leaving asset holders in almost as liquid a position as before. Thus, for example, when M1 decelerates, a small increase in short-term interest rates can persuade people to hold savings deposits instead, to feel as if their liquidity is as great as before and, hence, to maintain the same level of spending.

The second problem is that relatively small changes in people's preferences or in financial institutions can cause large changes in the demand for the aggregate. Thus, the innovation of daily interest chequing accounts beginning in 1979 seems to have caused a significant decrease in the demand for M1. This was one of the problems that led the Bank to abandon Gradualism.

The problem of substitutability with assets outside the aggregate is not limited to M1. Even the broadest aggregate, M3++, is subject to the same problem because, for example, it excludes the liquidity available to households and business firms through credit cards, trade credit, lines of credit with financial institutions, deposit accounts with investment dealers, holdings by Canadians of foreign bank deposits, and many other items.

The choice of which aggregate to control, therefore, depends on several relevant criteria, all of which involve empirical judgments.

The first criterion is that the demand for the aggregate be stable. Frequent large shifts in the demand for the aggregate being controlled leads to unwanted shifts in aggregate spending.[4] The presence of close substitutes makes this particularly a problem with M1, but the extent of the problem with broader aggregates is an empirical question. The next section investigates the issue of stability in greater detail; this analysis supports the conclusion that while the demand for M2 and other broad aggregates appears to be sufficiently stable to permit Adaptive Monetary Control, the demand for M1 is not.

The second criterion is that the aggregate have a low sensitivity to changes in interest rates — that is, a low interest-elasticity of demand.[5] The lower is this elasticity, the more macroeconomic stability is achievable from controlling the aggregate — provided that its demand is stable. An unexpected reduction in aggregate spending that does not directly affect the demand for money causes the rate of interest to fall. This fall in the rate of interest tends to offset the reduction in spending. The smaller is the interest-elasticity of demand for the aggregate being controlled, the more the rate of interest has to fall to restore equilibrium and, hence, the larger is the offset to the reduction in spending. On this criterion, it is clear that controlling broad aggregates is preferable to controlling M1, because the broader aggregates have lower interest-elasticities.

The reason why broader aggregates have lower interest-elasticities is that, unlike M1, they include interest-bearing assets such as savings and term deposits. An increase in the general level of interest rates reduces the demand for money by raising the opportunity cost of holding money — that is, by raising the amount of interest lost by someone who holds money instead of an interest-bearing, nonmoney asset. In the case

[4] It is important to distinguish here between shifts in the demand function for money — the function that determines how much money people want to hold when real income and the rate of interest are at any given level — and movements along the function caused by changes in income or in the rate of interest. The principles outlined in Chapter 2 imply that it is shifts in the demand function that cause problems for monetary targeting, not movements along the function.

[5] The Bank has maintained in the past that a low interest-elasticity is not a desirable characteristic because it makes the aggregate harder to control. The discussion in this paragraph abstracts from the question of controllability, which is dealt with later on.

of broad aggregates, this effect is relatively weak — generally speaking, when the overall level of interest rates rises, so do the rates on savings and term deposits.

The third criterion is that the aggregate be highly sensitive to changes in national income — that is, that it have a high income-elasticity of demand. A high income-elasticity acts like a low interest-elasticity to enhance the stabilizing properties of monetary control. The higher is this income-elasticity, the more a reduction in aggregate spending causes a fall in the demand for money and, hence, brings about a fall in the rate of interest. On this criterion as well, broader aggregates are preferable to M1.

The fourth criterion is that the aggregate be controllable. Other things being equal, the Bank ought to attempt to stabilize the aggregate over which it has the most control. On this criterion, the Bank has argued in favor of M1. But, as Courchene has emphasized,[6] this judgment is based on the theory that the supply of money should be controlled indirectly, by regulating its demand. I agree with Courchene that the way to control money is by regulating its supply, not its demand. The control-mechanism issue is discussed in a subsequent section of this chapter.

Thus, on all criteria with the possible exception of controllability, broadly defined money is preferable to M1. But the criterion of controllability is really subsidiary to the first three. If, by the first three criteria, it is clear that the Bank should be controlling, say, M2, there is no reason to argue in favor of controlling M1 simply on the grounds that it is easier. Under the circumstances, if M2 were hard to control, then the Bank would have a hard job, but to opt for M1 control would be to abandon the job.

Although these considerations argue for controlling broadly defined money, they do not indicate which of the various broad aggregates should be controlled. Furthermore, economic science does not predict unambiguously that one particular collection of financial assets should be controlled no matter what is happening to the rest. Common sense dictates that attention be paid to a broad spectrum of monetary aggregates. When they all seem to be rising above or all falling below their targets, the Bank should attempt to bring them under control. When all but one are behaving in a similar fashion, it must be supposed that the one deviant aggregate is being affected by developments peculiar to the assets on the margin of that aggregate, with no important macroeconomic consequences. When some broad aggregates are growing above target and some below, with no clear predominance of one group over the other, some interpretation may be needed to decide what the Bank should be doing.

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[6]Thomas J. Courchene, *Money, Inflation, and the Bank of Canada, Volume II: An Analysis of Monetary Gradualism, 1975–80* (Montreal: C. D. Howe Institute, 1981), especially Chapter 7.

Figure 2 presents the growth rates of a wide range of monetary aggregates. It shows that, with the exception of M1, all the aggregates for which data are available back to 1975 exhibit clearly excessive monetary growth throughout the 1975–80 period of Gradualism. Had the Bank followed the principle of Adaptive Monetary Control during this period, it would have ignored the deceleration of M1, attributing it either to a shift in M1 demand or to a gradual increase in nominal interest rates that did not necessarily signal monetary restraint, and it would have followed the more restrictive policies that it now realizes in retrospect it should have followed.

Similarly, all the broad aggregates shown in Figure 2 agree that monetary deceleration finally began in late 1979 or early 1980. They also agree that the deceleration continued until the first quarter of 1984, when all of their growth rates finally stopped falling. Generally speaking, there is a very high degree of correlation among their growth rates.

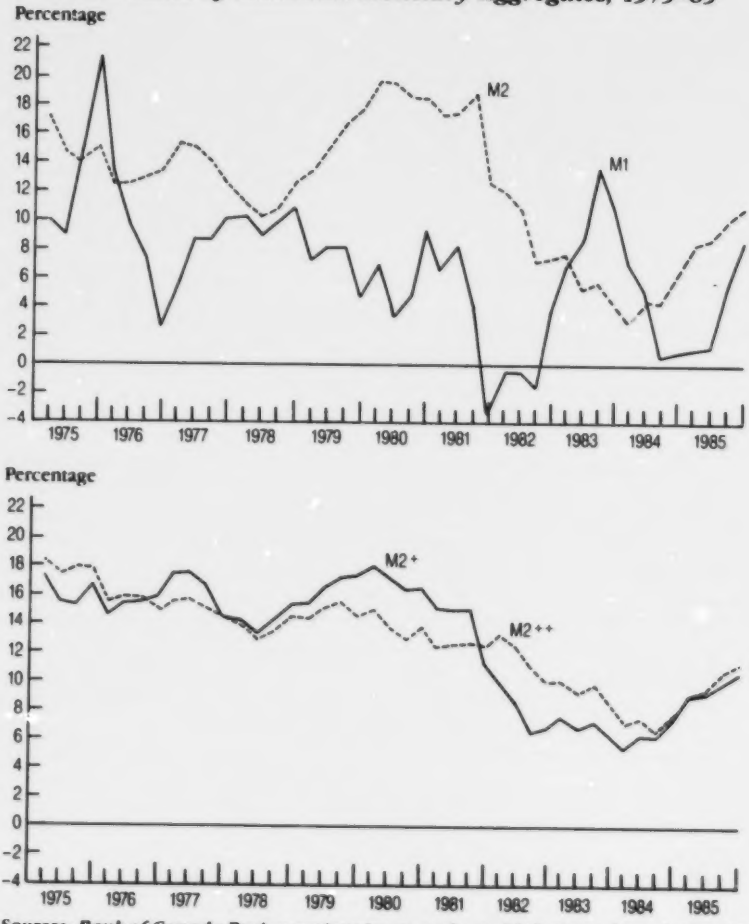
In these respects, all the broad aggregates are in agreement. But, as Figure 2 clearly reveals, they also occasionally disagree. For example, the deceleration since 1981 has been considerably more gradual in M2++ and M3++ than in all the others. Thus, by the first quarter of 1984, M2++ was growing at a seven percent rate while M3 was contracting at a one percent rate.

These disagreements usually can be accounted for plausibly by referring to unusual credit-market developments. In 1982 and 1983, for example, the abrupt end to new private-sector borrowing and the sharp rise in public-sector borrowing had a strong impact on the structure of interest rates in the economy. Because so much of government borrowing is directly from the public rather than through financial intermediaries, its growth prevented M2++ and M3++ — the "double-plus" aggregates, which include primary liquid assets that are not liabilities of banks or other financial intermediaries — from decelerating as rapidly. This shift in borrowing demand is reflected in the fall in bank-deposit interest rates relative to Treasury Bill or commercial paper rates. This change in relative interest rates is what induced people to increase their holdings of primary liquid assets relative to bank deposits.[7]

With such interpretations in mind, one can make an educated guess at the "underlying rate of monetary expansion". For example, the negative figures for M2-C and M3 in the first quarter of 1984 certainly underestimate the underlying rate because the corresponding "plus" aggregates, which include nonbank financial intermediary deposits, both

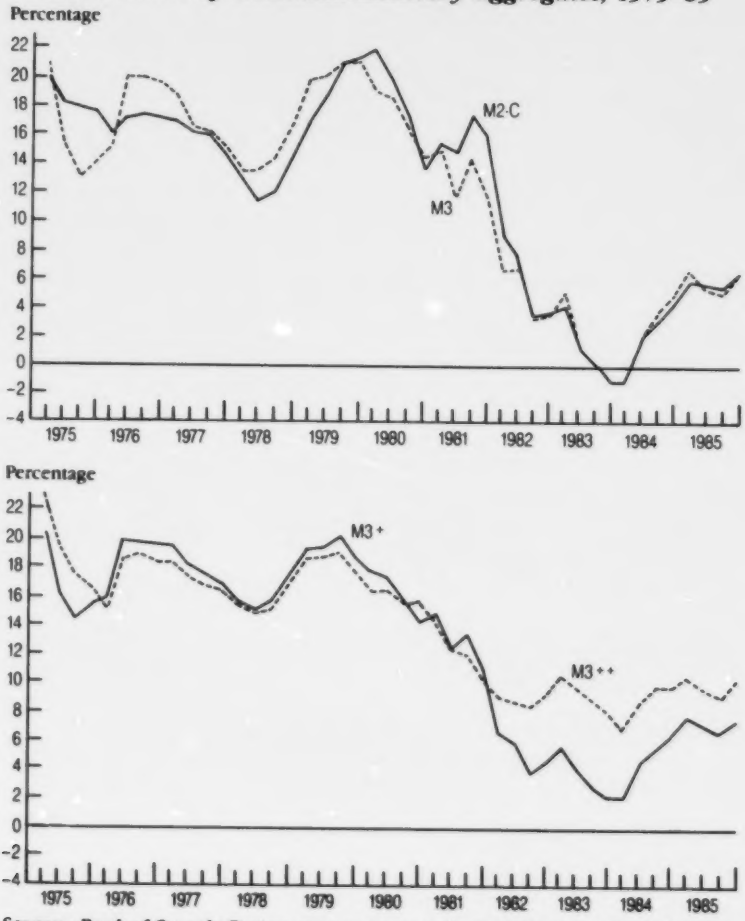
[7]The Bank presented a similar analysis in three articles entitled, "Monetary Aggregates: Some Recent Developments," (*Bank of Canada Review*, December 1983, January 1985, and January 1986). As is explained in the next section and again in Chapter 6, I do not agree with certain aspects of these articles.

Figure 2
Growth Rates of Canadian Monetary Aggregates, 1975–85



Sources: ***Bank of Canada Review***, various issues, and unpublished data from the Bank of Canada.

Figure 2, continued
Growth Rates of Canadian Monetary Aggregates, 1975–85



Sources: ***Bank of Canada Review***, various issues, and unpublished data from the Bank of Canada.

had positive growth rates during the period. Thus, a shift obviously took place between banks and other intermediaries, one with no major macroeconomic significance. Similarly, the roughly 7 percent growth rate of the "double-plus" aggregates in the same quarter probably overstates the underlying rate because it is so heavily influenced by the large increase in Canada Savings Bonds and Treasury Bills with which the federal government financed much of its growing deficit. A large increase in these government securities probably has the effect of raising other interest rates rather than lowering them.

Thus, the best estimate of the underlying rate in the first quarter of 1984 is probably given by M2+, which was growing at a 5.5 percent rate, or M3+, which was growing at a 2.1 percent rate. Taking the simple average of these two figures gives an estimate of 3.8 percent as the underlying rate of monetary expansion, a rate roughly consistent with long-term price stability.

Now, this estimate is obviously very rough. Even the two "single-plus" aggregates diverged by 3.4 percentage points during the quarter in question. But it must be remembered that the change in the pattern of borrowing in 1982 and 1983 between the public and private sectors was on a scale unprecedented in postwar Canadian history. It must also be noted that even the 3.4 percent divergence that remains in the estimates in this unusual time is far from disastrous. If temporary, such a divergence of broadly defined money from its target probably is not enough to create a major economic downturn. Nor would such a divergence, even if it persisted for a year or two, be enough to give inflation enough momentum to become a major economic problem.

Thus, even though the principle of Adaptive Monetary Control does not state unambiguously which of the broad aggregates should be controlled, this does not normally lead to any ambiguity as to how restrictive the Bank's policies should be. And even when the growth rates of the various broad aggregates show unexplained differences, they are rarely large enough or long-lasting enough to cause serious problems.

Instability in the Demand for Money

The major reason for the failure of the Bank of Canada's strategy of Gradualism was that the demand for M1 was subject to large, unpredictable shifts. In particular, changes in the kinds of deposits and other services offered by banks reduced substantially the demand for personal chequing accounts and business current accounts. Many economists see this problem as undermining the very foundation of any program of monetary control. If the money supply is kept on a constant growth path, then large, unforeseeable shifts in the demand for money lead to large, unforeseeable, and unwanted shifts in nominal spending.

It is important to distinguish between three kinds of shifts. The first is a permanent change in the quantity of money demanded — the kind that would be induced by a financial innovation which allowed people to economize on their cash holdings. The second shift is a temporary change — the kind that would be occasioned by an unexpected coincidence of many large payments in the economy which people simultaneously wanted to hold in the form of money for a period of several days or weeks, but which would have no lasting effect on the demand for money. The third shift is what one might call "drift" in the demand for money — a gradual, ongoing change in the quantity of money demanded that might occur as the payments system gradually evolves toward the "cashless society". All three kinds of shifts create potential problems for any regime of monetary control, and this section discusses them in turn.

Permanent Shifts

Permanent shifts in M1 began to occur soon after Gradualism was implemented. Researchers have identified four separate instances of permanent shifts: two associated with the corporate demand for current accounts and two associated with the household demand for chequing accounts.[8]

The first shift on the corporate side took place around 1976, when chartered banks began to offer cash-management packages to their largest corporate customers. These packages included "concentration accounts", which allowed the corporation to consolidate many accounts in different banks across the country into a single account that could be managed more efficiently. The corporation then could invest any surplus cash in short-term, interest-earning assets. The packages also included various techniques for more efficient collection of payments and disbursal of funds. More importantly for present purposes, the packages provided for surplus cash to be invested overnight on the basis of the day's closing balance. The effect of these features was to reduce virtually to zero the demand for current accounts by corporations acquiring such packages.

Another shift appears to have occurred sometime in 1981, when chartered banks began offering the same packages to medium-sized corporate customers.

The two shifts on the household side occurred with the introduction of daily interest savings accounts in 1979 and daily interest chequable accounts in 1980. Both of these types of accounts lie outside M1, and their

[8]For an outline of the nature of these shifts and the dilemma they pose to the Bank, see Charles Freedman, "Financial Innovation in Canada: Causes and Consequences," *American Economic Review* 73 (May 1983): 101–106.

Table 3
Changes in the Composition of M1-A in Canada, 1978 and 1984

Item	1978 $ billions	1978 percent of total	1984 $ billions	1984 percent of total	% change 1978–84
Currency	8,139	34.5	12,408	30.4	52.5
Personal chequing accounts	3,144	13.3	3,217	7.9	2.3
Daily interest chequing accounts	0	0	5,543	13.6	n.a.
Current accounts	11,675	49.6	13,642	33.4	16.8
Nonpersonal notice accounts	1,828	7.8	6,228	15.3	240.7
Total M1-A[a]	*23,562*		*40,812*		*73.2*

[a]Items add up to more than M1-A because M1-A is net of float whereas items are gross of float.

Source: ***Bank of Canada Review***, various issues.

introduction induced many customers to hold less in their conventional chequing accounts — that is, to reduce their demand for M1.[9]

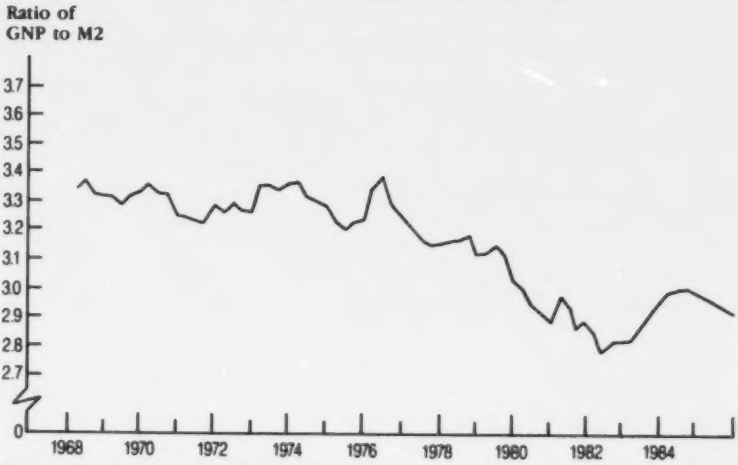
The magnitude of these shifts is hard to identify precisely. But there is no doubt that it is large. Quarterly estimates of the demand function for M1 indicate that it shifted down by 5–8 percent in 1976, by 2–3 percent in 1979, and by more than 20 percent in 1981, resulting in a cumulative downward shift over that five-year period of at least 28 percent.[10]

Another indication of the size of the shift in the demand for M1 can be gleaned from Table 3, which shows the changes in the composition of M1-A over the six-year period from the end of 1978 until the end of 1984. Over this period, personal chequing accounts rose by only $73 million, while daily interest chequable savings accounts started at zero and rose to over $5.5 billion. On the corporate side, current accounts rose by 16.8 percent, while nonpersonal notice accounts, one of the repositories of surplus cash for firms using cash-management packages, rose by 240.7 percent — that is, to 15.3 percent from 7.8 percent of M1-A. These data tend to confirm the results of the money-demand studies — namely, that there has been a great deal of substitution for M1.

[9]Actually, the trust and mortgage loan companies began offering daily interest accounts several years before 1979. This ought to have had an effect on the demand for M1 but to my knowledge, no one has identified that effect econometrically.

[10]See Stephen J. Poloz, "Unstable Velocity and the Monetary Approach to Exchange Rate Determination" (Paper prepared for the Economic Research Institute, Economic Planning Agency, Tokyo, December 1984).

Figure 3
Velocity of Canadian M2, 1968–85



Source: ***Bank of Canada Review***, various issues.

How much of this substitution is due to changes in computer technology and how much to an effect of high interest rates is difficult to tell. There is also the possibility, raised by Courchene in 1977, that the new accounts were a deliberate response by chartered banks to Gradualism.[11] By encouraging their customers to substitute for M1, the chartered banks were able to expand their total assets more rapidly than the M1 target growth rates.

Whatever the cause, the substitution was not predictable. Nor was it clearly distinguishable for some time from the normal weekly and monthly variability of M1. Because these problems continue to plague M1, it no longer makes much sense to control such a narrowly defined aggregate.

Although these problems have rightly discredited M1 targets, they do not seem to have impinged on broadly defined money. All of the shifts that have taken place between current accounts or personal chequing accounts on the one hand, and personal daily interest accounts or nonpersonal notice accounts on the other, have been within M2 and all broader aggregates.

One might think that some of the uses of cash-management packages would reduce corporations' demand for broadly defined money. For

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[11] Thomas J. Courchene, ***The Strategy of Gradualism: An Analysis of Bank of Canada Policy from Mid-1975 to Mid-1977*** (Montreal: C.D. Howe Research Institute, 1977).

example, if corporations used their concentration accounts routinely to pay down demand loans at the end of each business day, then the reduced demand for current accounts would not show up as an increased demand for any other accounts. But there is no evidence yet to suggest that such shifts have been significant.

Figure 3 gives an idea of the small effect these shifts have had on the demand for broadly defined money. The figure shows the movement of M2 velocity — that is, the ratio of nominal GNP to M2. This was relatively constant from year to year, with a tendency to drift down, from 1968 until 1985. The average percentage change (in absolute value) from the previous year was only 2.13.[12] In only two years was this percentage change more than 4 percent, and in each case the change was less than 1 percent in the following year.

If the demand for M2 had been reduced by any of the above changes in bank deposits, significant increases in velocity would have been expected in at least one of the years 1976, 1979, or 1981. There was an increase in 1976, but it was less than 3 percent; in 1979 and 1981, there were actually slight decreases in M2 velocity.

Thus, while the demands for broader aggregates such as M2 are not necessarily free from permanent shifts, there is no reason to suppose that such shifts have yet become a significant problem.

Temporary Shifts

Temporary shifts are the sort that could induce unwanted random variability in output if the money supply were not to accommodate them. After a lengthy discussion of the first kind of shift, this kind can be dealt with quite briefly.

If temporary shifts are measured by the residual errors in the money-demand equations estimated by econometricians, then, as was claimed in the previous section, they tend to be smaller for M2 than for M1. This finding has been documented by Dufour and Racette in their comprehensive survey of the available evidence.[13]

The size of the residual error is also small. To take a representative example, consider the M2 function estimated by Boughton.[14] The standard error of his quarterly estimates was less than one percent. It is true that the effect of a random shift in money demand tends to grow over time

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[12]These annual figures actually refer to four-quarter averages of velocity.

[13]See Jean-Marie Dufour and Daniel Racette, "Monetary Control in Canada," in John Sargent, research coordinator, *Fiscal and Monetary Policy*, Collected Research Studies of the Royal Commission on the Economic Union and Development Prospects for Canada no. 21 (Toronto: University of Toronto Press, 1986), pp. 199–256.

[14]See J.M. Boughton, "Recent Instability of the Demand for Money: An International Perspective," *Southern Economic Journal* 47 (1981): 579–597.

because of the lagged response in the demand equation. But even taking this into account, with the relatively large adjustment required by Boughton's estimated equation, the residual error has a standard deviation of only 2¼ percent.[15]

Drift in the Demand for Money

A gradual evolution toward a cashless society would produce an upward trend in the velocity of the circulation of money. As credit becomes more acceptable and easier to use, the demand for broad aggregates could be reduced, because short-term financial needs could be met by extension of credit. To put it another way, one might view unused but readily available automatic credit facilities as a form of money that should be added to any broad aggregate. If these facilities keep growing at a very rapid rate and M2 is kept on a path where it is growing at the same rate as potential GNP, then the more appropriate aggregate that includes credit facilities will be growing more rapidly than potential GNP, and this could cause a long-term inflation problem.

The importance of this possibility is easy to overestimate. Day-to-day experience impresses on us the growing use of plastic — particularly bank credit cards — instead of cash. But the impressions of daily experience can be misleading. Much of the demand for, and use of, money arises from business transactions and such large household transactions as car and mortgage payments, which are not part of one's daily or weekly shopping experience and for which credit cards are not used.

An objective look at the facts reveals that, even now, bank credit cards account for only a tiny fraction of all transactions in the economy. Purchases on Visa and Mastercard, for example, amount to about $15 billion annually.[16] This is a huge amount, but it pales in significance compared with the total value of transactions paid for by cheque. Canadians write about $20 billion worth of cheques *every day*.[17] In fact, as Figure 3 reveals, the general tendency seems to have been for velocity to fall rather than to rise over recent years.

Thus, there is as yet no reason to suppose that the evolving payments system has caused any significant upward drift in velocity. This does not

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[15]"Standard deviation" is a common statistical measure of variability of an economic variable. The smaller the standard deviation, the less the variable tends to deviate from its average value. For example, a variable whose behavior can be described by the "normal distribution" of statistics textbooks will be within one standard deviation of its average value 66 percent of the time, and within two standard deviations 95 percent of the time.

[16]Marian Stinson, "Bank Cards Geared to Carriage Trade," *Globe and Mail* (Toronto), March 29, 1985, p. R6.

[17]David Climenhaga, "Automatic Clearing Alters How Canada Banks," *Globe and Mail* (Toronto), March 29, 1985, p. R3.

mean that an upward drift will not begin to develop. The evolution of the payments mechanism may begin to affect the demand for liquid assets significantly. Also, as further integration of the entire financial system continues, under the pressure of international competition, the increasingly sophisticated packages of financial services available to households and businesses will further reduce the demand for liquid assets. Because of these very real possibilities, the Bank of Canada should continue to monitor financial developments and be ready to revise target growth rates for broadly defined money accordingly.

Summary

To sum up this section, it appears, first, that permanent shifts in the demand for broadly defined money may have occurred, although not on a large enough scale to affect the efficacy of a regime of monetary control; second, that temporary shifts also have occurred, but these apparently are no more a problem than are permanent changes; and third, that drift in the demand for money has not yet become a problem, although it may in the future.

Although there is no evidence that shifts in the demand function would pose a serious problem if the Bank were to adopt Adaptive Monetary Control, the Bank nevertheless would have to remain vigilant. As was argued in the section on nominal-income targeting in Chapter 2, the Bank should adjust its target growth rate when there are definite indications of velocity drift. It should also shift the target ranges downward when there are definite indications of a permanent downward shift in the money-demand function.

The experience of Gradualism should stand as a stern warning of the need for such vigilance. Just as the demand function for M1 started to change unpredictably when the Bank tried to control M1, so the demand function for broadly defined money might become unstable if the Bank were to adopt a policy of Adaptive Monetary Control. Demand functions represent the decisions of human beings who are capable of changing their behavior when confronted with a change in the policy environment. Thus, for example, an attempt to control M2 might induce banks and non-bank intermediaries to create a new class of deposits that could be substituted for the savings and term deposits in M2, thereby causing a shift of unpredictable size in the demand function for M2.

Although it is important to be vigilant for possible instability in the demand function for broadly defined money, this possibility does not, in my opinion, undermine the case for Adaptive Monetary Control, for three reasons.

First, the possibility that an apparently stable economic relationship might change once one begins to base economic policy on that relation-

ship is a fundamental problem confronting any macroeconomic policy, not just Adaptive Monetary Control.[18] If that fundamental problem undermines Adaptive Monetary Control, then it undermines all economic policy. The proper way to react to the problem, therefore, is not to despair but to be willing to adapt as new evidence comes in that the relationship is changing. Just as people who decide how much money to hold are capable of adapting to changing policies, so those in charge of monetary policy are capable of reacting to a changing money-demand function. If the demand function becomes sufficiently unstable, then the best way of adapting might be to adopt a completely different policy. But that does not mean one should abandon the idea of Adaptive Monetary Control before trying it, and before a better policy has been invented.

Second, as was pointed out in Chapter 2, the historical record suggests that instability and drift in the demand function for broadly defined money have not been important factors in determining the course either of the business cycle or of inflation, despite the fact that the strategies and policies pursued by the Bank, and by the federal government in general, have changed considerably. This evidence lends a strong presumption to the hypothesis that instability will not be such a great problem as to undermine seriously a policy of controlling broadly defined money.

This same presumption should make the Bank extremely cautious in accepting econometric evidence that the demand function for broadly defined money has shifted, unless there is plenty of direct, corroborating evidence. In the case of M1 under Gradualism, the Bank was almost certainly right in believing that shifts were occurring, because of the clear-cut evidence of the changing composition of business and household accounts, as indicated in Table 3. But I do not agree, for example, with the Bank's attributing the rise in the velocity of broadly defined money that occurred in 1983 to a shift in the demand function for broadly defined money because in this case there is no such clear-cut evidence.[19]

Third, the discussion in the previous section suggested that it would be wrong for the Bank to focus exclusively on any single aggregate. An attempt to control M2 to the exclusion of all other aggregates might induce the growth of substitutes for M2 deposits. But an attempt to control broadly defined money more generally would not be so likely to induce such a reaction, especially if it were known that the Bank was

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[18]This is the message of the "Lucas critique". See Robert E. Lucas, Jr., "Econometric Policy Evaluation: A Critique," in Karl Brunner and Allan H. Meltzer, eds, *The Phillips Curve and Labor Markets*, Carnegie-Rochester Series on Public Policy no. 1 (Amsterdam: North-Holland, 1976), pp. 19–46.

[19]This analysis is contained in "Monetary Aggregates: Some Recent Developments," *Bank of Canada Review*, January 1985, especially p. 13. It is discussed in greater detail in Chapter 6.

willing to adapt to the invention of substitute deposits by attempting to control them along with the previously existing deposits.

Controlling Broadly Defined Money

The Main Issues

An important practical issue that must be dealt with under any regime of monetary control is precisely how the Bank can control the money supply. Many economists have argued that the ideal way is to control the growth rate of the monetary base — that is, currency in the hands of the public plus chartered bank reserves, which include the chartered banks' holdings of currency and deposits with the Bank of Canada. A similar scheme is to control just the reserve component of the base, or to control unborrowed reserves — total reserves minus advances by the Bank to the chartered banks and money-market dealers. All of these schemes are designed to work directly on the supply of money through the money multiplier.[20] The advantage of using the base, or one of the above variants, as the instrument of policy is that it is directly under the Bank's control and, in turn, has a direct effect on the supply of money whose growth rate the Bank is trying to stabilize.

Recent U.S. experience has cast doubt on the wisdom of base control. Between October 1979 and September 1982, the Federal Reserve tried to control M1 using unborrowed reserves as its instrument. The apparent result was a period of wild fluctuations both in the quantity of M1 and in interest rates. Large fluctuations in interest rates are a predictable consequence of tight monetary control and are an essential part of the stabilizing tendency of monetary control. But in this case, the policy did not even produce monetary control.[21] Clearly, the Federal Reserve's 1979–82 operating procedure did not achieve the desired result. This raises questions of whether any such base-control regime can work so as to keep a broad monetary aggregate on target.

The alternative to base control is interest control. This is the alternative that the Bank of Canada used under Gradualism. Under interest control, when a slowdown in monetary growth is desired the Bank raises interest rates. The Bank believed that the rise in interest rates would work indirectly on the supply of money, by changing the quantity demanded. As interest rates rose, people would want to hold less money. This would

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[20]The money multiplier is the ratio of the money supply to the monetary base.

[21]As Milton Friedman has observed, the standard deviation of quarter-to-quarter changes in M1 went from 1.3 percent over the period between the third quarters of 1976 and 1979 to 4.7 percent between the third quarters of 1979 and 1982 ("Monetarism in Rhetoric and in Practice," *Monetary and Economic Studies* [Bank of Japan] 1 [October 1983]: 1–14).

generate an incipient excess supply of money, which, if it were allowed to persist, would make interest rates come back down. In order to prevent interest rates from coming down, the Bank would have to withdraw enough base money so that the supply of the chosen aggregate fell by as much as the demand.

According to the Bank's view, broadly defined money would be just as difficult to control using interest rates as it would using the base. This is mainly because the interest-elasticity of the demand for broadly defined money is so low.[22] In this view, it would take unacceptably large increases in interest rates to make the demand for M2 fall by even modest amounts. Thus, the only practical way of controlling M2 using interest rates is indirectly, by controlling nominal income. Raising interest rates reduces aggregate spending, which reduces nominal income, which reduces the demand for M2, which reduces the supply of M2. But, the Bank argues, this indirect method is not guaranteed to produce the desired path of broadly defined money, because it involves long and unpredictable lags.

Thus, it seems that there are important practical obstacles to overcome if the Bank is to deliver the smooth growth path of broadly defined money that the principle of Adaptive Monetary Control calls for. The rest of this section examines these obstacles.

Interest Control versus Base Control

The difference between interest control and base control is not in the kind of operations the Bank would use to control the money supply. In either case, if it wanted to reduce the rate of monetary expansion, the Bank probably would begin transferring more federal government deposits out of the chartered banks.

Instead, the difference is a matter of what day-to-day operating rule to follow. Under interest control, the Bank first would decide on the rate of interest most likely to put the money supply on target. It then would conduct its day-to-day reserve management with a view to achieving that rate of interest, regardless of how big a change in the base was required. Under base control, the day-to-day operations would be conducted with the immediate objective of creating the amount of monetary base — or reserves, or unborrowed reserves — that the Bank judged would most likely support the desired money supply, and the rate of interest would be left free to fluctuate on the market.

The best instrument to use is the one that produces the most predictable effects on the money supply. Thus, the question at issue is whether

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[22]This is the view of William R. White ("Alternative Monetary Targets and Control Instruments in Canada: Criteria for Choice," *Canadian Journal of Economics* 12 [November 1979]: 590–604).

it is easier for the Bank to judge the effect on the money supply of a given change in the rate of interest, or of a given change in the monetary base.

It follows that the difference between interest control and base control is one that matters only for short periods of time. The Bank has to choose something to guide its operations until more information comes in. When the Bank learns that it has made a mistake and missed its target, it can revise its instrument settings. Similarly, when the Bank receives news of developments that it knows will otherwise affect the money supply, it can change its settings to anticipate these effects. Such news comes in daily and weekly. Any instrument that can be adjusted to this kind of news from week to week so as to keep broadly defined money from straying for prolonged periods outside its target ranges is as good as any other such instrument.[23]

Base Control

The U.S. experience of the 1979–82 period revealed that the money multiplier is not stable and that smooth growth of the base produces erratic movements in the money supply.

Instability of the money multiplier is due to two main sources. First, the nonuniformity of reserve requirements means that unpredictable changes between different classes of deposits change the required reserves of the banking system. When people switch to deposits with lower reserve requirements, this frees up reserves; if the central bank does not respond by contracting the quantity of total reserves, these free reserves are added to the supply of credit and the money supply expands.

The second reason for instability in the money multiplier is the system of lagged reserve accounting. Under this system, any increase in the demand for bank credit that tends to raise interest rates will induce the banking system to expand loans and, hence, to create more deposits, even though the quantity of reserves has not increased. The chartered banks are not constrained by the existing supply of reserves, because the quantity that they must hold this period depends not on how many deposits they create during the period but, rather, on how many they have already created.

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[23]This view of interest versus base control contradicts the justly famous and often-cited analysis of William Poole ("Optimal Choice of Policy Instruments in a Simple Stochastic Macro Model," *Quarterly Journal of Economics* 84 [May 1970]: 197–216), according to which, the choice of instrument will have important implications for the stability of real activity. Poole derives this implication from his assumption that, under either regime, the instrument will be held constant for long enough for an unforeseen shock to the demand for goods and services or the demand for money to have a significant impact on the money supply and on the economy in general, rather than being reset as new information comes in. Thus, Poole's article is best read as an analysis of the consequences of deliberately stabilizing interest rates in the face of shocks to the economic system versus a policy of stabilizing the monetary base.

Under lagged reserve accounting, the only way the central bank can use reserve control is to operate indirectly through the expectations of the chartered banks.[24] If the central bank does not wish the banking system to accommodate an increase in the demand for credit, it must announce that any increase in deposits this period will not be accommodated by an increase in unborrowed reserves next period. Instead, the chartered banks will have to borrow their extra required reserves next period. This means that the cost of short-term borrowing to meet reserve requirements is driven up by competition. In anticipation of this higher cost, the chartered banks may choose not to expand their deposits this period.

Thus, there is a mechanism under which reserve control can work. But it depends on the chartered banks' expectations concerning the future cost of borrowing. The U.S. experience suggests that this mechanism is not predictable enough to avoid sharp month-to-month fluctuations in the supply of money.

Both of these problems would exist if the Bank of Canada were to attempt base control of broadly defined money. There are large differences in the reserve requirements for different types of deposits: 11 percent on demand deposits with chartered banks, 3 percent on notice and term deposits with chartered banks, and no reserve requirement at all on the deposits of nonbank intermediaries or on the nondeposit liquid asset components of the broadest definitions. Furthermore, under current regulations, the quantity of reserve deposits that any chartered bank must hold with the Bank of Canada depends not on its deposits during the current (half-month) reserve period but on the average of the four weeks ending with the second week of the previous month.

Empirical work by Bank of Canada economists Clinton and Lynch underscores the importance of these two factors in producing an unstable money multiplier.[25] They found that fluctuations in the multiplier for M2-C about its trend had a standard deviation of about 2 percent. That is, if the monetary base had been held constant, and if the multiplier had varied the same as it did, then the money supply would have been subject to unpredictable fluctuations whose standard deviations were 2 percent of the money supply.[26] Furthermore, they determined that most of the variability in the ratio of M2-C to reserves was attributable to two

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[24]For an analytical account of this mechanism, see Timothy D. Lane, "Money Supply Control and Lagged Reserve Accounting," *Journal of Money, Credit, and Banking* 16 (November 1984, Part 1): 536–546.

[25]Kevin Clinton and Kevin Lynch, *Monetary Base and Money Stock in Canada*, Bank of Canada Technical Report no. 16 (Ottawa: Bank of Canada, 1979).

[26]Ibid., especially Table 1. Clinton and Lynch found this result for both monthly and annual fluctuations. Note in their Table 1 that the standard deviations of the base multiplier are the standard deviation of the difference in annual growth rates between M2-C and base for annual data and one-twelfth of that for monthly data.

factors: the ratio of statutory to actual deposits and the ratio of demand to time deposits.[27] The first of these factors would not have varied at all under a system of contemporaneous reserve accounting. The second would not have affected the size of the multiplier had reserve requirements been uniform.

This suggests two broad conclusions. First, accurate, month-to-month base control of M2 or of any other broad aggregate that excluded non-deposit liquid assets could be achieved only under a system of contemporaneous and uniform reserve requirements. Contemporaneous requirements are technically feasible. They have now been implemented in the United States,[28] and there is no reason why they could not be implemented in Canada.

Uniform reserve requirements also could be adopted, but this would raise difficult political problems. First, in order to avoid making reserve requirements an unwanted tax on financial intermediaries and to avoid giving an incentive to various financial institutions to create unregulated substitutes for reservable deposits, interest would have to be paid on the required reserves. It would not be easy to decide that rate of interest or to prevent the federal government from reducing the rate as a means of raising its revenues.[29]

Second, deposits at trust and mortgage loan companies, credit unions, and caisses populaires are included in many of the broad aggregates that the Bank should be monitoring. But the nonbank intermediaries are largely under provincial jurisdiction. One attempt already has been made to bring provincially regulated intermediaries under the umbrella of reserve requirements. The federal government's 1978 White Paper on proposed revisions to the ***Bank Act*** recommended imposing reserve requirements on any institution that joined the newly formed Canadian Payments Association. That attempt failed when Quebec refused to accept this encroachment on its jurisdiction. If the Bank were to use its influence more vigorously next time, provincial opposition might be overcome. It is also possible that the re-examination of the regulation of Canada's financial system that is currently taking place at several levels will result in a more centralized system that would make reserve requirements easier to impose on nonbank intermediaries. In any event, it would be no small matter to accomplish the kind of uniform reserve requirements that would be needed for perfect control of broadly defined money.

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[27]Ibid., the last line of their Table 2.

[28]They were also in force in the United States prior to 1968.

[29]Nevertheless, the Blenkarn report on regulation of the Canadian financial system has recommended the payment of interest on reserves. See House of Commons, Standing Committee on Finance, Trade and Economic Affairs, ***Canadian Financial Institutions*** (Ottawa: Speaker of the House, November 1985).

The second conclusion suggested by this discussion of the money multiplier is that none of the evidence referred to demonstrates that the Bank cannot use the base to control broadly defined money with a reasonable degree of accuracy over periods as long as two or three quarters. Empirical work on the U.S. experience has focused on month-to-month fluctuations, because the Federal Reserve was, in fact, trying to control money on a month-to-month basis. But the principle of Adaptive Monetary Control outlined above calls only for control over a period of several months.

Furthermore, U.S. studies do contain estimates of quarterly and annual control errors that were likely under the U.S. 1979–82 control regime, even with lagged and nonuniform reserve requirements, and they are within the range for which the principle of Adaptive Monetary Control would call. One study, for example, estimates that over the period of a year, the Federal Reserve was able to control M1 with a standard error of 1.3 percent.[30] Another study concludes that the Federal Reserve could have controlled M1-B with a mean absolute error of between 0.8 percent and 1.2 percent over quarterly intervals.[31] Whether these results would carry over to Canada and to broader aggregates is a question that has not yet been investigated. But it suggests that even under existing institutional arrangements, base control could keep the money supply from departing significantly from a target path over periods of several months.

Interest Control

The Bank of Canada argues that interest control cannot be used to target broadly defined money, for the following reasons. If the supply of money is too high, then to bring it back into the target range one also has to reduce the demand for money. To do this in the space of a month or two may require large increases in interest rates, because the demand for broadly defined money is not very sensitive to interest rates. One could avoid these large increases by a more gradual policy, but this would just be engaging in an indirect form of nominal-income control. That is, one could raise interest rates by a more moderate amount and wait until the rise in interest rates slowed aggregate spending. As spending slowed, so would nominal income and the reduction in nominal income would reduce the demand for money.

There are two major faults with this argument. The first is that even if large changes in interest rates were required to keep broadly defined

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[30]Peter A. Tinsley et al., "Policy Robustness: Specification and Simulation of a Monthly Money Market Model," *Journal of Money, Credit, and Banking* 14 (November 1982, Part 2): 829–856.

[31]David Lindsey et al., "Monetary Control Experience under the New Operating Procedures," in *New Monetary Control Procedures*, vol. 2 (Washington, D.C.: Board of Governors of the Federal Reserve System, 1981), Tables 7 and 8.

money on target, this fact would not invalidate the arguments underlying Adaptive Money Control. It would imply that for interest rates to play their role of stabilizing real output and employment, they have to be allowed to vary a great deal. Highly volatile interest rates may have undesirable social consequences, but these must be weighed against the obvious social cost of volatile output and employment that results from attempting to stabilize interest rates.

The second fault with the Bank's argument is that there are good reasons to doubt that the rate of interest, in fact, would have to vary by as much as the Bank claims. In particular, it is not at all clear that to reduce the supply of money by x percent, the Bank would have to raise interest rates by enough to reduce the demand for money by x percent. According to the buffer-stock theory of money, which has been advocated recently by a number of economists with a variety of different viewpoints, a reduction in the supply of money will not be matched immediately by an equal fall in demand.[32] Instead, it will leave an excess demand that can persist for several months.

The buffer-stock theory further states that the rate of interest will rise not by enough to equate the supply and demand for money but only by enough to equate the supply and demand for credit — bank loans, bond issues, and so on. The Bank's restrictive operations will create an excess demand for credit, which the rise in interest rises will eliminate. Generally speaking, the supply and demand for credit ought to be sufficiently responsive to the rate of interest that the huge interest-rate increase the Bank fears will not be necessary to eliminate this excess demand.

The buffer-stock theory is so named because it depicts money as an item that individuals routinely use to absorb unforeseen shocks. An unforeseen shortfall in income is met initially by allowing money holdings to be depleted — that is, by allowing an excess demand for money to develop. An individual can eliminate his or her excess demand by buying less from others, but this creates a cash shortage for others. For society as a whole, the excess demand for money can persist for a long time.

There are several reasons for preferring the buffer-stock theory to the equilibrium theory — according to which, an excess demand for money will be eliminated in short order by a rise in interest rates — held by the Bank.[33] Perhaps the strongest reason is that the buffer-stock theory pro-

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[32]Peter Howitt and David Laidler, "Recent Canadian Monetary Policy: A Critique" (Paper presented to conference on Issues in Canadian Public Policy (II) at Queen's University, Kingston, Ont., April 1979); David Laidler, "The Buffer Stock Notion in Monetary Economics," *Conference Papers*, Supplement to *Economic Journal* 94 (March 1984): 12–34; Robert J. Gordon, "The Short-Run Demand for Money: A Reconsideration," *Journal of Money, Credit and Banking* 16 (November 1984, Part I): 403–434; and Charles Goodhart, "Disequilibrium Money — A Note," (Paper prepared for the Bank of England, London, 1982).

[33]For an elaboration of these reasons, see Laidler, "The Buffer Stock Notion in Monetary Economics."

vides a more plausible explanation of short-term interest determination. It says that the rate of interest is determined by the supply and demand for the credit instruments that yield the interest, rather than the supply and demand for something else (money).[34]

Thus, the buffer-stock theory of money gives good reasons for thinking that Adaptive Monetary Control would not produce the high degree of interest-rate variability that the Bank fears. Furthermore, even if the buffer-stock theory is incorrect, a high degree of interest variability would in itself be no reason to give up the idea of controlling broadly defined money.

There is one more related concern the Bank has that must be addressed here: the problem of instrument instability. Specifically, the Bank worries that the attempt to keep monetary aggregates closely on target will cause explosive cycles in interest rates. Its reasoning can be illustrated with the following example.[35] Suppose that there is a random increase in the supply of money, which the Bank wishes to correct with a rise in the rate of interest. This will bring the money supply back down this month. But suppose that the supply of money responds not just to this month's rate of interest but also to last month's. The interest-rate increase that got the money supply back on track this month will have a reinforced effect next month, because it will have both a current and a lagged effect. To prevent this reinforced effect from causing the money supply to overshoot and fall below its target, the rate of interest will have to fall next month. Continuing this line of reasoning, it can be seen that the original disturbance will require the Bank to respond with alternating increases and decreases of the rate of interest in each successive month. Furthermore, if the effect of last month's interest rate on the money supply is numerically stronger than the effect of this month's rate, it can easily be demonstrated that the Bank must change the rate of interest each month by more than it did the previous month. Thus, the rate of interest will have to follow an explosive cycle to keep the money supply on target.

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[34] In terms of the *IS–LM* diagram of macroeconomics textbooks, the equilibrium theory asserts that following a leftward shift in *LM*, the rate of interest rises immediately to stay on the *LM* curve, before output has adjusted. The buffer-stock theory says there is a third curve, analogous to Patinkin's *BB* curve, which depicts bond-market equilibrium. By Walras' Law, *BB* must be flatter than *LM*, and must pass through the intersection of *IS* and *LM*. The shift in *LM* must coincide with a shift in *BB*, and the rate of interest rises to stay on the *BB* curve. Some textbooks explain the *LM* curve as if it were the same as the *BB* curve on the grounds that there is only one portfolio-balance condition. But this explanation is invalid whenever some of the goods and services in the economy are assets that enter into people's portfolios. It is also invalid whenever there are transaction costs that break any neat separation between portfolio-allocation decisions and consumption-savings decisions.

[35] For a more rigorous presentation of this analysis, see Charles Freedman, "Some Theoretical Aspects of Base Control," in Douglas D. Purvis, ed., *The Canadian Balance of Payments: Perspectives and Policy Issues* (Montreal: Institute for Research on Public Policy, 1983), pp. 19–44.

Since instrument instability only applies when the Bank attempts a strict, month-to-month control, this problem should not be present under a sensible regime of Adaptive Monetary Control, which does not require such tight control. Furthermore, the lagged effects of interest rates are themselves dependent on the policies being pursued, because they almost certainly reflect the way people's expectations of future interest rates are correlated with lagged interest rates. When the policy regime changes, this correlation changes and, hence, the effect of last month's interest rate alters. Timothy Lane of Michigan State University argues, in my opinion convincingly, that even if month-to-month control were attempted, the lag structure probably would adapt in such a way as to avoid the explosive cycles that the Bank fears.[36]

Summary

Neither recent U.S. experience nor the Bank of Canada's concerns about the low interest-elasticity of the demand for broadly defined money offer convincing evidence that controllability is such a serious problem as to undermine Adaptive Monetary Control. Nor do they imply that controlling broadly defined money necessarily would lead to the kind of wild interest-rate fluctuations the United States experienced from 1979 to 1982. This experience can be attributed partly to the Federal Reserve's trying to hit a money target on a month-to-month basis in the face of an unpredictable money multiplier. It can also be attributed partly to the fact that, for much of that period, stabilizing private-sector responses had not yet developed, because people were still learning to adapt to the new policy environment which began in 1979.

It is also true, however, that sufficient quantitative knowledge of the money-supply process does not exist to determine the exact relationship between the Bank of Canada's operations and the supply of broadly defined money. The money multiplier is unpredictable. So are the demands for wholesale deposits, money-market securities, and loans, which determine the course of monetary contraction following a restriction in bank reserves. If the Bank is to learn to control broadly defined money, it will have to rely very much on trial and error whatever instrument it uses. Even when doing its best, the Bank must expect to see unanticipated deviations of the money supply from the target. In order to control the money supply, the Bank must be willing to adjust its instrument settings vigorously in response to any deviations that persist for longer than a month or two.

The fact that the Bank must rely on trial and error is unfortunate, but it is a fundamental problem of monetary policy in general, not just of

[36]Timothy D. Lane, "Instrument Instability and Short-Term Monetary Control," *Journal of Monetary Economy* 14 (September 1984): 209–224.

controlling broadly defined money. It is a mistake to look for magic formulas to achieve pinpoint control of any intermediate or ultimate target.[37] The Lucas critique suggests that even when such relationships are discovered, they are likely to change as soon as one begins to exploit them. This is just what happened to the M1 demand function that the Bank tried to exploit using interest control under Gradualism.

The fact that these relationships are unknown at the outset, however, does not mean that intermediate targets are uncontrollable. What brought down Gradualism was not that the shifting M1 demand function made M1 uncontrollable, but that controlling M1 became undesirable. Downward shifts in demand easily could be offset so as to keep M1 on track, by lowering interest rates when M1 fell below target. Similarly, a sufficiently vigorous adaptive policy should be capable of keeping M2 on target over periods of several months.

This is not to say that the Bank's trial-and-error process could not be informed by economic theory. In setting its instruments, the Bank could attempt not just to react to past errors but to anticipate future movements in broadly defined money. For example, if the Bank held the rate of interest constant, then anything that caused an increase in the demand for credit without reducing the demand for money would increase the supply of broadly defined money.[38] (To prevent this rise in demand from increasing the rate of interest, the Bank would have to expand the monetary base.) Thus, if the rate of interest were held constant, the money supply would be increased by a rise in U.S. interest rates,[39] by an autonomous rise in aggregate spending — for example, a rise in the federal deficit — or by a fall in the real exchange rate that raised Canadian net export demand. In order to prevent the money supply from being increased by any of these events, the Bank would have to raise interest rates. The more skillful it became in learning to anticipate potential movements in the money supply, the fewer errors it would make. But with the present state of knowledge, such foresight necessarily would be imperfect. For the foreseeable future, the Bank would have to spend as much effort adapting to past errors as it would to avoiding future ones.

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[37]The ultimate targets of monetary policy are those such as inflation and unemployment. The intermediate targets are such variables as nominal income and the money supply, which the Bank might seek to control as an indirect method of influencing the ultimate targets.

[38]That is, in textbook macroeconomic terms, a shift in the *IS* curve.

[39]For evidence of this positive effect of U.S. interest rates on the Canadian money supply, see Michael D. Bordo, Ehsan U. Choudhri, and Anna J. Schwartz, ***Money Growth Variability and Money Supply Interdependence under Interest Rate Control: Some Evidence for Canada***, NBER Working Paper no. 1480 (New York: National Bureau of Economic Research, October 1984).

Because there is no cut-and-dried recipe for control using either the monetary base or the level of interest rates as an instrument, it is impossible to say which is the better instrument. Perhaps the Bank's and other major financial-market participants' greater familiarity with interest control would make that policy slightly preferable, but that hardly constitutes a strong case against base control.

These considerations argue strongly in favor of a move toward uniform and contemporaneous reserve requirements, to be imposed on all deposit-taking financial intermediaries. This would make the money multiplier considerably easier to predict and, therefore, would make broadly defined money much easier to control using the base as an instrument. Thus, two recommendations that come out of this analysis are for the Bank (a) to institute contemporary reserve accounting and (b) to use its influence to help overcome the political problems of achieving uniform reserve requirements for all deposit institutions.

4

Macroeconomic Developments, 1982–85

During the 1982–85 period, Canada underwent a difficult transition from a long bout of high inflation to what one can hope will be an even longer era of low inflation. Inflation was brought under control mainly by a decline in the level of economic activity. The recession that started in mid-1981 and continued through the end of 1982 was followed by a prolonged period of high unemployment and excess capacity.

By the end of 1985, the transition was still under way. The economy continued to operate below capacity and inflation, although greatly reduced, remained at a high enough rate to be of concern.

The purpose of this chapter is to describe the macroeconomic transition of the 1982–85 period and to analyze the role of monetary policy in that transition. The first step is to chronicle the course of inflation over the period and to discuss the major factors influencing that course, of which the most important was the 1981–82 recession. This is followed by a discussion of the recession and subsequent recovery. Although there are several nonmonetary factors that one can point to as having contributed to the recession and as having influenced the course of recovery, there is no doubt that monetary policy played a central role. The monetary deceleration that began sometime in 1979–80 and gathered force in 1981–82 was violent enough to have caused a recession even if the various nonmonetary factors had not been present. And the fact that the monetary deceleration continued until 1984 goes a long way toward explaining the slowness of the recovery.

Inflation

Over the first quarter of 1981, the Consumer Price Index (CPI) grew at an annual rate of 15.4 percent. But by the fourth quarter of 1985, that rate had declined to 4.8 percent. Table 4 shows a similar decline in two other measures of price inflation: the rates of change of the GNP deflator and of the Industry Selling Price Index (ISPI), although the decline is harder to see in the ISPI than in the other two indices because it is a more volatile series. A similar decline can be seen in the three measures of wage inflation shown in Table 4. These measures indicate that by the fourth quarter of 1985, wages were rising at an annual percentage rate that was 6 to 10 points below the rate prevailing in the first quarter of 1981.

Table 4
Measures of Canadian Inflation, 1981–85

	Consumer Price Index[a]	GNP deflator[b]	Industry Selling Price Index[a]	Average hourly earnings in manufacturing[a]	Wages and salaries per unit output[b]	Wage settlements excluding COLA
1981						
Q1	15.4	12.5	11.5	14.2	9.0	13.7
Q2	13.9	7.3	10.6	12.7	10.6	12.6
Q3	9.5	11.4	6.9	12.3	17.6	13.8
Q4	9.7	11.9	4.6	11.5	16.6	13.9
1982						
Q1	13.2	12.2	7.0	14.8	13.0	12.9
Q2	12.4	7.4	7.0	8.2	5.6	12.5
Q3	6.3	9.9	3.8	7.2	1.0	10.2
Q4	5.4	9.5	−0.1	8.7	5.6	7.2
1983						
Q1	5.0	1.1	4.0	8.1[c]	−3.7	6.7
Q2	5.6	4.4	5.7	4.3	2.7	5.8
Q3	3.8	6.7	2.4	4.2	1.4	5.7
Q4	3.8	−1.0	2.4	9.3	−3.5	4.1
1984						
Q1	5.5	3.3	7.9	6.8	−2.6	3.9
Q2	3.3	5.5	3.0	2.9	4.6	2.9
Q3	2.6	−0.9	1.4	4.4	0.5	3.0
Q4	3.6	2.7	2.7	4.7	4.2	4.5
1985						
Q1	5.3	5.6	4.8	4.6	3.9	3.8
Q2	4.9	3.9	1.4	0.0	2.4	3.4
Q3	2.5	1.6	0.6[d]	4.6	2.4	3.8
Q4	4.8	2.2	4.6	7.8	−0.6	3.5

[a]Change from last month of previous quarter to last month of current quarter at annual rates.
[b]Seasonally adjusted, change from previous quarter at annual rates.
[c]Break in series.
[d]ISPI replaced by Industrial Product Price Index after 1985:Q2.

Source: *Bank of Canada Review*, various issues.

The decline in inflation was more sudden than almost anyone had predicted.[1] According to all three measures of price inflation, all of the decline that occurred between 1981 and 1985 had already taken place by the first quarter of 1983. Since then there has been no discernible downward trend in the rate of price inflation.

[1]The only economist I know who was predicting publicly in 1981 that a precipitous decline in inflation was about to occur was my colleague Michael Parkin in his article, "Watch Out for Falling Inflation," *Canadian Business Review* (Autumn 1981): 18–23.

Table 5
Year-to-Year Change in the Canadian Consumer Price Index, 1981–85
(percentage change from same quarter of previous year[a])

Quarter	1981	1982	1983	1984	1985
Q1	12.2	11.5	7.6	5.2	3.7
Q2	12.6	11.5	5.9	4.6	4.0
Q3	12.7	10.6	5.3	3.9	4.0
Q4	12.3	9.7	4.6	3.7	4.2

[a]The figure for each quarter represents the average rate of inflation over a period centered around a date *two quarters earlier.*

Source: *Bank of Canada Review,* various issues.

The decline in wage inflation was somewhat less sudden, but most of this decline, too, seems to have occurred in 1982. This is certainly true of the rate of increase in new wage settlements. It also appears to be true of the rate of change of hourly earnings, although it is hard to be sure because of a break in this data series in February/March 1983. The decline in the rate of change of wages and salaries per unit output shown in Table 4 looks even more sudden than the decline in price inflation. This is largely due, however, to an increase in productivity during the late stages of the recession and the early stages of the recovery.

The decline in inflation was not only more sudden than had been predicted, it was also more sudden than most people realized at the time. For example, a survey of a group of 17 leading forecasters in the spring of 1983 resulted in predictions of the rate of CPI inflation between 1982 and 1983 that ranged from 6.2 to 8.6 percent.[2] The actual rate turned out to be only 5.8 percent.

One of the reasons why it took so long for many people to discover the change in the trend of inflation that occurred in 1982 is that they are used to looking not at quarter-to-quarter changes in the CPI as shown in Table 4 but at year-to-year changes as shown in Table 5. The year-to-year rate of CPI inflation shows almost exactly the same overall decline between the first quarters of 1982 and 1985 as the quarter-to-quarter rate. But it portrays the decline as being much more gradual. This is because a change in the trend rate of inflation takes 12 months to be fully reflected in the year-to-year rate.

[2]Dana Oikawa, "Modest Recovery Underway," *Canadian Business Review* 10 (Spring 1983): 2–5.

Table 6
Change in the Canadian Consumer Price Index, Using the U.S. Method for Measuring Housing Costs, 1981–84
(change from previous quarter at annual rates)

Quarter	1981	1982	1983	1984
Q1	16.1	12.3	1.6	6.0
Q2	18.6	9.9	6.3	3.6
Q3	13.5	3.5	8.1	3.0
Q4	3.4	−3.9	4.2	3.5

Source: Peter DeVries and Andrew Baldwin, "Impact of Different Homeownership Methodologies on Consumer Price Index Behaviour between Canada and the United States," *Canadian Statistical Review*, April 1985, pp. vi-xv.

In fact, the decline in consumer price inflation may have been even more sudden than is indicated by the quarter-to-quarter CPI changes. This is because of the way the housing component of the CPI is calculated. To measure the interest cost of owner-occupied housing, Statistics Canada uses a 60-month moving average of the prevailing mortgage-interest rate, multiplied each month by a fraction of an index of current housing prices, where that fraction represents the typical homeowner's debt-value ratio. Thus, a permanent change in the rate of inflation in housing prices takes five years to be fully reflected in the CPI; this tends to make the CPI artificially sluggish.

Some indication of the importance of this housing factor is attainable from a report by DeVries and Baldwin, who recalculated the Canadian CPI using the same method as in the United States for the housing component.[3] The U.S. method is different in several respects from the Canadian method, but the most significant difference during a time of large swings in interest rates, such as the 1981–84 period, is likely to be the fact that the U.S. method does not involve any long moving average.

Table 6 shows what the CPI inflation figures of Table 4 would have looked like had the recalculated CPI of DeVries and Baldwin been used. It shows even higher inflation than does the official CPI in 1981, because the big rise in mortgage rates that year was not fully reflected in the official CPI. It also shows an even sharper decline in 1982 than does the official CPI. As expected, it also exhibits much greater volatility over the whole period.

[3]Peter DeVries and Andrew Baldwin, "Impact of Different Homeownership Methodologies on Consumer Price Index Behaviour between Canada and the United States," *Canadian Statistical Review*, April 1985, pp. vi–xv.

It is hard to know whether Table 4 or Table 6 gives a better picture of what was happening to the true cost of living, because the U.S. method is also imperfect. But two important conclusions can be drawn. First, the data in Table 6 confirm the message of Table 4 that the drop in inflation was very sudden and was accomplished mainly by the beginning of 1983. Second, Table 6 shows that if the U.S. housing method had been used, the decline in the inflation would have appeared not only to have been more sudden but also to have taken place earlier.

Accounting for the Behavior of Inflation

The Recession

The main factor accounting for the sudden decline in inflation was undoubtedly the 1981–82 recession. A large decline was just what one would expect to result from the most severe recession since the Great Depression of the 1930s. The fact that inflation did not start to decline noticeably until some time in 1982 — a year or so after the onset of the recession — also is about what one would expect on the basis of past experience with the inertia of inflation,[4] although at the time it seemed as if the decline was taking forever to materialize.

The precise speed with which inflation declined once it began could not have been predicted. These precise timing relationships are not the sort of phenomena that economists understand well. Similarly, the fact that there has been so little further progress in reducing inflation since 1982 is not easy to explain. But in broad terms, the decline in inflation over the 1982–85 period is readily explainable as a consequence of the recession.

A more detailed explanation of what determined the course of inflation has to take account of two other factors. The rest of this section examines these factors and then sums up with some tentative conclusions regarding the likely future course of inflation.

Government Restraint

One additional factor that determined the course of inflation was the set of government restraint programs in effect during 1982 and 1983. The federal government's "6 and 5" program was designed to limit the growth

[4]Milton Friedman, for example, has asserted that a decline in inflation following a decline in the rate of monetary expansion should come some six to nine months following the decline in output. In Canada, the lag appears to have been closer to 12 months but, as Friedman has always emphasized, these lags are quite variable. See, for example, Milton Friedman, *The Counter-Revolution in Monetary Theory* (London: Institute of Economic Affairs, 1970), especially pp. 22–26.

of both the government deficit and wage increases of federal employees. Several provincial governments instituted similar programs.

These restraint programs may have had some effect on inflation by persuading people that the government really was determined to fight inflation. Some people think that the announcement of "6 and 5" in June 1982 ended a speculative run on the Canadian dollar which could have had inflationary consequences had it resulted in a large depreciation. In addition, "6 and 5" may have helped stiffen the resistance of business firms to inflationary wage settlements.[5] It told them that they could no longer pass on large wage increases in the form of higher prices without losing government contracts. It is also conceivable that the example of low public-sector wage settlements helped to restrain unions demands in the private sector.

The fact that inflation dropped so suddenly in mid-1982, around the time when restraint programs were being announced, might be seen as additional evidence that these programs played an important role in determining the course of inflation.

I am inclined to attach less importance than others to the role of restraint programs in explaining the drop in inflation, for two main reasons. First, it seems unlikely that the programs could have had a large immediate impact on the rates of change of reported price and wage indices. But the big drop in CPI inflation was almost coincidental with the June 1982 announcement of "6 and 5", and before the announcement of provincial programs. Both CPI and ISPI inflation obviously had started their decline even earlier. Indeed, within a few months after these programs had been announced, price inflation was proceeding at less than the federal 6 percent limit. These considerations suggest that something other than restraint programs was the main factor at work. Second, there is little evidence that public-sector wage settlements have an emulation effect on private-sector wages.[6] For these reasons, I think government restraint programs played no more than a secondary role in bringing down inflation.[7]

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[5]See Richard G. Lipsey, "The Great Anti-Inflation War 1975-?" E.S. Woodward Lectures in Economics (Vancouver: University of British Columbia, Department of Economics, 1983), especially pp. 16–19.

[6]See, for example, Pierre Fortin and Keith Newton, "Labor Market Tightness and Wage Inflation in Canada," in Martin Neil Baily, ed., *Workers, Jobs, and Inflation* (Washington, D.C.: Brookings Institution, 1982). This paper also contains references to other evidence that the effect is negligible (see footnote 40, pp. 258–259).

[7]This conclusion seems to be borne out by Douglas Auld and David Wilton in *Public Sector Wage Inflation and the Ontario Controls Programme* (Toronto: Ontario Economic Council, 1985). This investigation found no evidence that the Ontario program significantly reduced the rate of wage inflation in either the private or the public sector.

Table 7
Implicit Price Deflators of Canadian Exports and Imports Relative to GNE Deflator, 1980–85

	Exports	Imports	GNE	Ratio of exports to GNE	Ratio of imports to GNE
1980	278.2	261.3	225.8	1.09	1.16
1981	298.6	289.9	249.7	1.20	1.16
1982	306.6	303.0	275.5	1.11	1.10
1983	306.5	299.3	290.1	1.06	1.03
1984	311.2	316.3	298.2	1.04	1.06
1985	320.9	331.9	307.1	1.04	1.08

Source: *Bank of Canada Review*, various issues.

The Canadian Dollar

The other additional factor to consider in understanding the course of inflation is the value of the Canadian dollar on foreign exchange markets. During the 1980–85 period, the Canadian dollar depreciated by about 14 percent relative to the U.S. dollar. One might suppose that by raising the foreign component of the CPI, this was a significant factor keeping the Canadian inflation rate high during the period.

This explanation, however, does not stand up in the face of the evidence, presented in Table 7, that the price of foreign goods, either imported or exported, actually fell relative to the Gross National Expenditure (GNE) deflator over the 1980–85 period. This evidence can be reconciled with the behavior of the Canadian dollar on foreign exchange markets by noting two important facts. The first is that although the Canadian dollar depreciated against the U.S. dollar, it appreciated against most other major currencies at the same time. Table 8 shows an enormous appreciation relative to four European currencies, ranging from 25 percent in the case of Swiss franc to 81 percent in the case of the French franc. Similar appreciations occurred against other European currencies. Apart from the United States, the only other major trading partner against whose currency the Canadian dollar depreciated was Japan.

Of course, the United States is by far Canada's biggest trading partner, accounting for approximately three-quarters of Canadian exports and imports in 1984, and Japan is the second biggest. So more weight must be given to the two currencies against which the Canadian dollar has depreciated than to the rest. On the other hand, the appreciations were much larger than the depreciations, so even if they get less weight in the calculations, it is conceivable that an appropriate weighted-average exchange rate would show that, overall, the Canadian dollar has appreciated since 1980.

Table 8
Canadian Dollar Exchange Rates Expressed in Different Currencies, 1980–85
(annual averages)

	U.S. dollars	U.K. pounds	French francs	West German marks	Swiss francs	Japanese yen	IMF effective rate	Bank of Canada G–10 rate
1980	0.855	0.368	3.609	1.552	1.431	192.9	1.000	81.7
1981	0.834	0.412	4.335	1.880	1.634	183.5	1.029	81.5
1982	0.810	0.463	5.305	1.966	1.642	201.4	1.049	81.2
1983	0.811	0.535	6.158	2.069	1.703	192.7	1.083	82.1
1984	0.772	0.578	6.725	2.192	1.809	183.3	1.063	79.3
1985	0.733	0.565	6.523	2.138	1.781	173.4	1.027	75.6
percent appreciation or depreciation 1980–85	−14.3%	+53.5%	+80.7%	+37.8%	+24.5%	−10.1%	+2.7%	−9.3%
percent real appreciation 1980–85[a]	−6.1%	+55.1%	+63.6%	+62.9%	+44.3%	+12.4%	–	–

[a]See footnote 8 for calculations.

Sources: *Bank of Canada Review*, various issues; *International Financial Statistics* (International Monetary Fund), May 1986; and author's calculations.

The International Monetary Fund (IMF) publishes such a weighted-average exchange rate — the "effective" exchange rate shown in the second-to-last column of Table 8. The Bank of Canada also publishes one — the Group-of-Ten (G-10) rate shown in the last column of Table 8. Both of these measures indicate that over the 1980–83 period, the Canadian dollar actually appreciated. Taking into account the lag with which exchange-rate movements affect inflation, it is probably safe to conclude that for most of this period, currency appreciation was exerting a downward pressure on Canadian inflation.

The other important fact to note in this connection is that through the first half of the 1980s, inflation was more rapid in Canada than among its trading partners. Table 9 shows that from 1980 to 1985, the Canadian GNE deflator rose more rapidly than the export prices of most of the countries listed in Table 8. This suggests that even if the dollar had not appreciated, the foreign component of the Canadian price level would have grown less rapidly than the domestic component. The prices of Canadian imports would have grown at the lower foreign rate of inflation, and prices of Canadian exports would have been held down by the slower increases of Canada's competitors' prices.

Table 9
Changes in Canada's GNE Deflator and in Export Prices of Selected Countries, 1981–85
(annual percentage change)

	GNE deflator	Export deflators of other countries				
	Canada	U.S.	U.K.	France	West Germany	Japan
1981	10.6	9.2	8.5	13.7	7.6	3.1
1982	10.3	1.6	6.2	12.8	4.4	5.5
1983	5.3	1.0	6.6	10.9	1.3	-6.8
1984	2.8	1.4	8.0	11.6	3.5	0.1
1985	3.2	-0.7	4.5	3.9	3.9	-0.7
Average 1981–85	6.4	2.5	6.8	10.5	4.1	0.2
Average 1983–85	3.8	0.6	6.4	6.8	2.9	-2.5

Sources: Statistics Canada, *System of National Accounts: National Income and Expenditure Accounts*, Cat. no. 13-201, various issues; and OECD *Economic Outlook*, various issues.

These two factors, currency appreciation and differences in inflation, can be combined to calculate what has happened to Canada's "real" exchange rate — that is, the price of Canadian goods relative to foreign goods, both expressed in a common currency. Canada's real exchange rate with another country is computed by dividing the Canadian price level by the foreign level and then multiplying by the Canadian exchange rate as expressed in units of that country's currency.

Between 1980 and 1985, Canada's real exchange rate — using the CPI as the price level — rose relative to that of every country in Table 8 except the United States.[8] Even relative to the United States, it fell by only 6.1 percent. These data make it clear that any reasonable weighted-average real exchange rate would show a substantial real appreciation for the Canadian dollar. In fact, the IMF real exchange rate that uses the wholesale price index shows a 4.6 percent real appreciation, while the one that uses the value-added deflator shows a 14.3 percent real appreciation.

The same appreciation is apparent when exchange rates are adjusted for changes in wages. Table 10 shows Canada's unit labor cost relative to that of its trading partners, as calculated by the IMF. This measure

[8]This is indicated by the last row of Table 8, which equals $[(1 + a)\ P^{C}_{1985}/P^{*}_{1985} - 1] \times 100$, where a is the decimal equivalent of the percent appreciation from the second-to-last row of Table 8, and where P^{C}_{1985} and P^{*}_{1985} are the Canadian and foreign Consumer Price Indices, with 1980 = 100.

Table 10
Canada's Relative Unit Labor Cost, 1980–85[a]
(1980 = 100)

	1980	1981	1982	1983	1984	1985
Q1				115.0	119.3	116.0
Q2				116.8	116.5	112.3
Q3				119.2	116.9	111.8
Q4				119.6	117.2	108.5
Annual	*100.0*	*108.2*	*111.8*	*117.7*	*117.5*	*112.2*

[a]Adjusted for cyclical variations in productivity.

Source: *International Financial Statistics* (International Monetary Fund), May 1986.

is affected by productivity as well as by wages, but the IMF has corrected it for normal cyclical variations in productivity in each country. It shows that the labor cost per unit of goods produced in Canada relative to elsewhere in the world rose by 12.2 percent from 1980 to 1985.

Thus, the role of the Canadian exchange rate in the behavior of Canadian inflation has been just the reverse of what one might think. Instead of depreciation contributing to inflation, the substantial real appreciation since 1980 has made Canadian inflation lower than it otherwise would have been. In particular, the fact that so much of the appreciation of Canada's effective exchange rate occurred between 1981 and 1983 might help to explain why the slowdown in inflation, which we have so far attributed mainly to the recession, occurred almost entirely between those two years. The data in Table 7 support this conjecture — most of the decline in the relative price of internationally traded goods occurred during the same interval.[9] Thus, currency appreciation, like government restraint programs, may help to explain the suddenness of the decline in inflation.

The anti-inflationary influence of the exchange rate ended in 1984, with a depreciation of the effective exchange rate. The two IMF real exchange rates — that is, the one using wholesale prices and the one using value-added deflators — show a real depreciation of about 2 percent between 1983 and 1984. The quarterly data in Table 10 show a substantial real depreciation continuing from early 1984 through 1985. This recent depreciation may account for the slight upturn in Canadian inflation that

[9]This fall in foreign prices may be seen as a consequence of the sharp fall in world food and energy prices during the 1981–83 period. But this would not have impinged on the Canadian price level had the Bank allowed a depreciation to offset it. The fall in the world prices of food and energy certainly affected relative prices within Canada, but it affected the overall price level only to the extent that the Bank allowed it to result in a real appreciation of the Canadian dollar.

Table 4 seems to indicate started in the second half of 1984. The data in Table 7 support this conjecture, too — in 1984, the relative price of imports rose for the first time since 1980. The relative price of exports continued to fall, but this may reflect an ongoing worsening of Canada's terms of trade or the relatively longer lag with which currency depreciation affects the price of Canadian exports.

That the value of the Canadian dollar could have appreciated during a period when Canadian inflation was higher than in the rest of the world is an indication of how unimportant is purchasing-power parity over anything but the longest of time horizons. In the long term, countries with relatively high inflation should have depreciations that restore purchasing-power parity by stabilizing real exchange rates. But in Canada's case, that depreciation did not materialize at all during the 1980–83 period.[10] Instead, other factors were important in determining the exchange rate, factors that reinforced the effect of Canada's high inflation in making Canadian goods overpriced in world markets. The next chapter argues that those other factors have a lot to do with the conduct of monetary policy.

Summary

If the interpretation in the preceding section is correct, and the behavior of inflation is accounted for mainly by the excess capacity and unemployment generated by the recession, then inflation should continue to fall as long as the economy remains at less than full capacity — that is, as long as an excess supply of goods and labor continues to slow the inertial component of inflation.

There is an important qualification to this conclusion. The currency depreciation that Canada has experienced since early 1984 may temporarily slow, or even reverse, the fall in inflation, as it appears to have done somewhat since mid-1984. It is important to recall, however, that the effects of this depreciation will be temporary unless the depreciation continues.

In summary, it seems that inflation is not likely to be a serious problem until the Canadian economy is brought back to the neighborhood of a full-employment equilibrium. In 1985, that neighborhood was still far off. But there were then, and there are still, signs of continuing economic recovery. Together with the large, recent depreciation of the Canadian dollar and continued revival of monetary expansion, the recovery may soon mean that, once again, policymakers will have to give high priority to the objective of restraining long-term inflationary pressures.

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[10]Table 8 does show, however, a weak tendency toward purchasing-power parity, in the sense that the countries against whose currencies the Canadian dollar appreciated the most tend to be the ones with the highest inflation rates. Thus, the range of real appreciations in the last row of the table is somewhat narrower than the range of nominal appreciations in the preceding row.

Table 11
Indicators of Real Economic Activity in Canada, 1981–85

	Real GNP growth[a,b]	Employment growth[a,b]	Unemployment rate[b]	Capacity utilization[c]
1981				
Q1	8.8	5.4	7.3%	81.7%
Q2	4.0	1.9	7.1	82.3
Q3	-4.0	-0.6	7.4	79.6
Q4	-3.1	-2.1	8.3	77.2
1982				
Q1	-8.8	-4.2	8.9	74.0
Q2	-4.3	-5.3	10.4	71.2
Q3	-2.8	-5.6	12.2	68.8
Q4	-3.6	-2.2	12.8	67.4
1983				
Q1	8.4	2.3	12.5	69.3
Q2	7.3	5.9	12.2	71.1
Q3	7.5	4.3	11.6	72.7
Q4	5.4	1.4	11.2	75.0
1984				
Q1	4.1	1.0	11.4	75.4
Q2	3.0	2.6	11.4	75.7
Q3	6.7	3.9	11.2	78.0
Q4	3.4	2.0	11.1	77.5
1985				
Q1	4.1	1.1	11.1	77.5
Q2	3.2	5.4	10.6	78.5
Q3	7.0	1.9	10.3	80.0
Q4	5.4	4.2	10.2	80.9

[a]Percentage change from previous quarter at annual rates.
[b]Seasonally adjusted.
[c]Total nonfarm goods-producing industries.

Source: *Bank of Canada Review*, various issues.

Recession and Recovery

To describe the course of real activity since 1982, it is necessary to look back to 1981. As Table 11 shows, activity levels started to fall sometime in the third quarter of that year. In that quarter, real GNP and employment fell sharply, unemployment started to rise, and the rate of capacity utilization fell below 80 percent.

By all these measures, economic activity continued to decline precipitously for six straight quarters through the end of 1982. Between the second quarter of 1981 and the fourth quarter of 1982, the cumulative fall in real GNP was 6.6 percent, and the fall in employment was 5 percent.

After 1982 the recovery began. All four measures of Table 11 agree that this occurred in the first quarter of 1983. Real GNP, employment, and capacity utilization all picked up sharply in that quarter and the rate of unemployment started gradually to fall from the peak of 12.8 percent reached the previous quarter. Since then, all measures show a steady increase in the level of activity.

During 1983 the recovery was strong. By the end of that year, real GNP had been restored to its prerecession level of the second quarter of 1981. Employment had risen almost 4 percent above its level of the end of 1982, bringing it close to the prerecession peak. The rate of capacity utilization had risen by 7.6 percentage points and the unemployment rate had fallen 1.6 percentage points.

The recovery slowed in 1984. Real GNP was 4 percent higher at the end of the year than it had been a year earlier and employment was 2.4 percent higher. Both are respectable figures for a normal year, but not for a year of recovery from such a deep recession. The rate of unemployment was only a tenth of a point lower and the rate of capacity utilization was 2.5 points higher.

The recovery proceeded more vigorously in 1985 than in 1984. Real GNP growth continued at a 5 percent annual rate. By the end of 1985, the unemployment rate had fallen almost a full percentage point from a year earlier, while the rate of capacity utilization had risen another 2.5 points.

At the end of 1985, the economy was still below full employment. This was most evident in the rate of unemployment. Most estimates of the "natural" or "nonaccelerating inflation" rate of unemployment in Canada in the mid- to late 1970s put that rate in the range of 6.5 to 7 percent. Since then, the various structural variables that have a positive effect on the natural rate — such as real minimum wages, the generosity of unemployment insurance, and the proportion of youths in the labor force — have tended to decrease.[11] The only factor that has tended to make the natural rate higher than that is the large change in the composition of demand that has taken place in Canada. Sectoral shifts increase the natural rate because it takes time for a worker displaced from a "sunset" sector to relocate and find an employer in a "sunrise" sector. The theory and measurement of this effect are still in their infancy, but in view of its possible importance, it seems prudent to take 7 percent as an estimate of the current natural rate.[12] (This is in the 6.5 to 8 percent range

[11] This argument borrows heavily from Pierre Fortin, "How 'Natural' Is Canada's High Unemployment Rate?" (Paper presented at the Annual Meeting of the Eastern Economic Association, Philadelphia, April 1986).

[12] For a report of an interesting attempt to measure the effect, see Lucie Samson, "A Study of the Impact of Sectoral Shifts on Unemployment in Canada," *Canadian Journal of Economics* 18 (August 1985): 518–530.

estimated by the Macdonald Commission, which also recognized the potential importance of the sectoral-shift effect.) By this estimate, the actual rate of unemployment in 1985 was still 3.5 percentage points above its natural rate. If one applies "Okun's Law" with a (relatively small) coefficient of 2, this suggests that output was 7 percent below capacity.

A similar message can be inferred from the real GNP statistics. The annual rate of increase in capacity output since 1979 can be estimated conservatively at 3 percent.[13] if one (reasonably) takes 1979 as a year of full employment, then by this measure, capacity GNP in 1985 was 5.6 percent higher than actual GNP. Similarly, the Bank of Canada's measure of capacity utilization showed an average of 79.2 percent in 1985, compared with 84.8 percent in 1979. If 1979 is taken as a year of full capacity, then by this measure, capacity output in 1985 was 7.1 percent higher than actual output. Taking all these measures into account, then, it seems that there was still an output gap of 5.5 to 7 percent in 1985.

Accounting for the Recession

Monetary Policy

There are several factors that can account for the 1981–82 recession. One of the most important of these is monetary policy. Sometime in 1981, the Bank of Canada decided that its approach to fighting inflation had been too gradual, too gentle. Its attempt to fight inflation with relatively little cost in lost output obviously had failed. After six years of Gradualism, the rate of inflation was even higher than it had been at the outset. The Bank decided that a much stronger dose of monetary restraint was needed, even if this resulted in a recession.[14]

As Figure 2 (in Chapter 3) shows, the annual growth rates of all the broad monetary aggregates were in the mid-teens or higher throughout the Gradualism era. The Bank's new policy finally managed to bring these growth rates down to less inflationary levels. The monetary deceleration that had started gradually in 1979–80 gathered force in 1981 and

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[13]One study estimates that potential output grew at an annual rate of 3.6 percent during the 1974–81 period. See Ernie Stokes, ***Canada's Output Growth: Performance and Potential, 1966–92***, Conference Board of Canada Technical Paper (Ottawa: Conference Board of Canada, April 1983). Stokes also predicted a slowdown to 2.4 percent during the 1982–87 period. I have chosen an average of these two figures as my estimate for the 1979–85 period. The number is slightly higher than the 2.8 percent estimated by Robert J. Gordon for the United States over the period since 1979 (see "Unemployment and Potential Output in the 1980s," ***Brookings Papers on Economic Activity*** [2: 1984]: 537–564). But this can be justified easily by the more rapid growth of the labor force in Canada over that period.

[14]For a detailed description of the switch from Gradualism to "cold turkey", see Thomas J. Courchene, ***No Place to Stand? Abandoning Monetary Targets: An Evaluation*** (Toronto: C.D. Howe Institute, 1983).

Table 12
Year-to-Year Growth of Canadian M2+ and M3+, 1980–85
(percentage change from same quarter of previous year)

	M2+	M3+
1980		
Q1	18.0	17.8
Q2	17.4	17.2
Q3	16.4	15.4
Q4	16.6	14.3
1981		
Q1	15.2	14.7
Q2	15.1	12.5
Q3	15.1	13.6
Q4	11.3	11.0
1982		
Q1	9.9	6.5
Q2	8.6	6.0
Q3	6.4	3.8
Q4	6.8	4.4
1983		
Q1	7.6	5.6
Q2	6.7	3.9
Q3	7.2	2.9
Q4	6.5	2.3
1984		
Q1	5.5	2.1
Q2	6.3	4.5
Q3	6.2	5.3
Q4	7.4	6.2
1985		
Q1	9.0	7.7
Q2	9.1	7.0
Q3	9.8	6.4
Q4	10.5	7.4

Source: Bank of Canada, unpublished data.

continued until late 1983 or early 1984. Table 12 records the deceleration of the two aggregates, M2+ and M3+, that in my opinion probably reflect most accurately what was going on at the time.

There is no doubt that, to eliminate inflation, the Bank had to bring about the monetary deceleration which Gradualism had failed to produce. But given the historical connection between monetary decelerations and severe economic downturns, it is not surprising that the huge deceleration recorded in Table 12 resulted in the most severe recession in half a century.

Monetary deceleration affects real activity by increasing the real exchange rate, increasing real interest rates, and causing a shortage of liquidity. The previous section documented the increase in the real exchange rate from 1980 to 1984.

It is impossible to get an accurate measure of real interest rates because no one knows how to measure inflation expectations, especially during a time of transition when expectations may be undergoing substantial revision. The 90-day real interest rate shown in Table 13 is an *ex post* rate — the real rate that a lender actually would have received by lending money for 90 days starting at the end of the previous quarter. Over long periods of time, this *ex post* rate should be an unbiased measure of the expected, or *ex ante*, real rate that matters for spending decisions. This is because it is reasonable to suppose that, on average, people's expectations of inflation are not biased systematically in one direction or the other. But during 1982 and 1983, the *ex post* rate probably exceeded the *ex ante* rate because the sudden fall in inflation was largely unpredicted.[15]

The real long-term rate is probably more important for spending decisions than the real short-term rate, but it is even harder to estimate because of the difficulty in estimating long-term inflation expectations. The real over-ten-year rate reported in Table 13, therefore, is even less reliable than the real 90-day rate. If people regarded the currently reported year-to-year inflation rate as the "underlying" rate of inflation most likely to prevail over the long term, then the rate reported in Table 13 would be accurate. But during the early 1980s, many people must have thought that inflation was bound to come down, whereas during 1983 and 1984, many obviously were worried that inflation might take off again.

About the only message that confidently can be drawn from these estimates is that since the first quarter of 1981, real interest rates generally have been much higher than their historical average. Over the 1954–80 period, the average values of the two proxy real rates shown in Table 13 were only 1.0 (for the 90-day rate) and 2.2 (for the over-ten-year rate).[16]

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[15]More sophisticated estimates of the 90-day real rate could be constructed, based on mechanical formulas for predicting inflation, but there is no way of knowing if these estimates would be any better than the *ex post* measures of Table 13.

[16]These data are taken from James Pesando, "Real Interest Rates in Canada in 1983: Perspective and Implications for Policy," in *Interest Rates and Recovery: Report of a Symposium* (Toronto, C. D. Howe Institute, 1983), Table 3. Note that all of these real rates are before-tax real rates. As Pesando notes, it is very difficult to calculate meaningful after-tax real rates, not only because different borrowers and lenders face different tax rates, but because when inflation causes nominal interest rates to change, the after-tax cost of capital to a business firm is affected through various channels other than the after-tax real rate of interest (especially historical cost accounting of depreciation allowances and inventory adjustments). Inflation tends to reduce the after-tax real rate of interest but it also tends to increase the real after-tax cost of capital through these other channels.

Table 13
Canadian Interest Rates, 1981–85

	90-day prime corporate paper rate[a]	Over-ten-year Government of Canada rate[b]	90-day real rate[c]	Over-ten-year real rate[d]
1981				
Q1	17.75	13.16	2.4	1.0
Q2	17.00	14.74	3.1	2.1
Q3	19.20	16.45	9.7	3.8
Q4	19.60	15.52	9.9	3.2
1982				
Q1	16.65	15.44	3.5	3.9
Q2	16.15	15.10	3.8	3.6
Q3	17.05	14.71	10.8	4.1
Q4	13.10	12.91	7.7	2.5
1983				
Q1	10.25	11.88	5.3	4.3
Q2	9.30	11.35	3.7	5.5
Q3	9.30	12.00	5.5	6.7
Q4	9.30	11.84	5.5	7.2
1984				
Q1	9.85	12.32	4.4	7.1
Q2	10.60	13.54	7.3	8.9
Q3	12.10	13.03	9.5	9.1
Q4	12.15	12.06	8.6	8.4
1985				
Q1	10.00	11.58	4.7	7.9
Q2	10.70	11.18	5.8	7.2
Q3	9.50	10.87	7.0	6.9
Q4	8.90	10.49	4.1	6.3

[a]Last Wednesday of preceding quarter.
[b]Average of Wednesdays of quarter.
[c]90-day rate minus annualized percentage change in CPI from last month of previous quarter to last month of current quarter (from Table 4).
[d]Over-10-year rate minus percentage change in CPI from same quarter of previous year.
Source: ***Bank of Canada Review***, various issues.

The monetary deceleration that the Bank of Canada produced in the early 1980s certainly had the effect of making real interest rates higher than they otherwise would have been, at least for some period of time. But it is important not to exaggerate the Bank's influence over real interest rates. The fact that Canada's real rates have been extremely high since 1980 is mainly attributable not to Canadian monetary policy but to the high real rates that have prevailed elsewhere in the world, especially in the United States.[17]

[17]For an interesting attempt to explain the global phenomenon of high real interest rates, see Olivier Blanchard and Lawrence Summers, "Perspectives on High World Real Interest Rates," ***Brookings Papers on Economic Activity*** (2: 1984): 273–324.

The shortage of liquidity in the early 1980s was reflected in the worsening financial situation of many borrowers. The debt-equity ratio of all manufacturing corporations rose sharply to 1.30 by the first quarter of 1982 from just over 1.11 in the first quarter of 1980. Through 1983, the Canadian corporate sector was plagued by historically high debt-service ratios, debt-equity ratios, and dependency on short-term finance.[18] In 1981 and 1982, the incidence of bankruptcy rose dramatically, and the financial plight of small businesses, farmers, and homeowners became a major source of political unrest.

Partly because of this worsening financial situation and partly because of the growing threat of a global debt crisis, Canadian lenders became less inclined to provide credit. The premium required on long-term corporate debt over long-term Government of Canada bonds rose to over 200 basis points by the end of April 1982 from an average of 75 basis points in 1979–80.[19] Bank lending came to an abrupt halt in the fourth quarter of 1981.

This worsening financial situation cannot be attributed entirely to the liquidity effects of monetary policy. Some of the rise in debt-equity ratios, for example, can be explained by the fact that in inflationary times, Canada's tax system encourages people to go into debt rather than to issue equity. Some of it can also be explained as an effect of the National Energy Policy (NEP), which created large tax incentives for Canadian corporations to borrow in order to acquire equity in the oil and gas industries. Similarly, the fall in bank lending is partly a result of those potential borrowers who remained creditworthy in the eyes of lenders not wanting to invest when there was so much excess capacity and when real interest rates were so high. But there is no doubt that credit would have been more available had monetary policy had been less restrictive.

Other Factors

Monetary policy was not the only factor contributing to the 1981–82 recession. The fact that the recession was worldwide meant that the aggregate demand for Canadian exports was reduced. In 1982 Canadian exports fell by 1.6 percent. Meanwhile, imports fell by an even larger 11.2 percent, so that Canada's trade balance actually *rose* by $10.5 billion. This is mainly attributable, however, to the fact that the recession was much deeper in Canada than in almost any other country in the world.

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[18]For details of these measures of liquidity, see H.P. Rousseau, "The Dome Syndrome: The Debt Overhanging Canadian Government and Business," *Canadian Public Policy* 9 (March 1983): 37–52.

[19]*Bank of Canada Review*, various issues. This comparison uses the over-ten-year rate on Government of Canada securities and the McLeod Young Weir weighted-average rate on long-term corporate securities.

Another international factor, which has already been mentioned, is the high level of U.S. real interest rates during the early 1980s. This factor certainly played an important role in the recession but, to a large extent, its role was just a manifestation of Canadian monetary policy. More specifically, the Bank of Canada tried to keep Canadian interest rates close enough to U.S. rates to avoid too large a depreciation in the Canadian-U.S. dollar exchange rate. If the Bank had followed a more independent interest rate policy, as did European central banks, Canadian real interest rates might not have behaved very differently — because of the high degree of international capital mobility — but the real exchange rate would have behaved quite differently. Instead of the real appreciation that occurred during the 1980–84 period, the Canadian dollar might have experienced a real depreciation, as did most European currencies.

According to the Fleming-Mundell model, which is the basis of many macroeconomic textbook treatments of the small open economy under perfect capital mobility, a rise in foreign interest rates should actually lead to an increase in the aggregate demand for Canadian goods and services, if the Bank keeps the money supply on target and allows the rise in interest rates to depreciate the Canadian dollar. There are reasons for not wanting to apply this theory directly to the case in hand, because it ignores several important considerations. But there is no doubt that if a rise in U.S. real interest rates had been allowed to generate a real depreciation of the Canadian dollar, the contractionary effect of that rise would have been diminished considerably. The real depreciation would have given an additional stimulus to Canada's net export demand. It also would have made investment demand fall by less than it did, because the fall in relative unit labor costs would have made Canada a more attractive place in which to construct and operate production facilities.

Another important international factor was the fall that occurred in 1981–82 in the relative prices of energy and basic commodities on world markets. Table 14 shows that the fall in the employment rate from 1980–81 to 1982–85 was most pronounced in the Prairie provinces and British Columbia, the regions that specialize most in producing those goods whose relative prices fell.

One domestic factor that contributed to the recession was the weakness of consumer demand. One expects personal consumption expenditures to fall during a recession because people's incomes are falling. But one also expects that the fall in consumption will be less than the fall in income, because people should go into debt and draw down liquid assets in an effort to maintain their accustomed standard of living. This should be reflected in a fall in the savings ratio — the ratio of personal saving to disposable income. But the Canadian savings ratio, which was already much higher than the U.S. rate in the late 1970s and early 1980s,

Table 14
Employment Rate by Canadian Region, 1980–85
(100 percent minus the unemployment rate)

	Atlantic provinces	Quebec	Ontario	Prairie provinces	British Columbia	Canada
1980	88.9	90.2	93.2	95.7	93.2	92.5
1981	88.4	89.7	93.4	95.5	93.3	92.5
1982	85.7	86.2	90.2	92.4	87.9	89.0
1983	85.0	86.1	89.6	90.3	86.2	88.1
1984	84.8	87.2	90.9	90.2	85.3	88.7
1985	84.0	86.2	92.0	90.8	85.8	89.5
% change 1980–81 to 1982–85	-4.3	-3.4	-2.8	-4.9	-7.5	-4.0

Source: *Bank of Canada Review*, various issues, Tables H7 and H8.

actually rose (to .152) in 1982. It is difficult to explain this rise in the Canadian savings ratio, but one cause may have been the liquidity shortage created by Canada's monetary deceleration.

A second domestic factor was the high level of indebtedness, which, to some extent, is attributable to the high rates of inflation in the late 1970s and early 1980s and to the tax incentives created by the NEP. This high level of indebtedness made many firms and households particularly vulnerable to the rise in world interest rates in the early 1980s. It also may help explain the rise in the savings ratio.

The vulnerability of consumers to high interest rates was greater in Canada than in the United States, not only because of the relatively higher levels of indebtedness in Canada but also because mortgage interest and interest costs of consumer durable purchases are not tax-deductible in Canada.

Yet another important domestic factor was the generally poor investment climate that government policies created. The discriminatory and retroactive aspects of the NEP, for example, discouraged foreign investment. The distrust engendered by these policies was exacerbated by a perception that the Foreign Investment Review Agency (FIRA) was hostile to foreign investors. And the fear of retroactive government measures was heightened by the tax reforms of the November 1981 federal budget. It is impossible to measure the quantitative effect of this "confidence" factor on the level of investment activity in Canada, but it would be rash to rule it out as a significant factor in the 1981–82 recession.

Canadian governments also contributed to some extent to the 1981–82 recession by a gradual tightening of fiscal policy over the 1978–81 period. Table 15 shows the inflation-adjusted structural deficit of the consolidated government sector in Canada, as calculated by the federal

Table 15
Inflation-Adjusted Structural Deficit of Canada's Consolidated Government Sector, 1978–84[a]
(as a percentage of GNP)

	Higher-trend output	Lower-trend output
Actual		
1978	1.4	1.8
1979	-0.8	-0.2
1980	-0.6	0.1
1981	-1.8	-1.0
1982	-0.6	0.3
Projected		
1983	-0.5	0.5
1984	-0.2	0.8

[a]Negative numbers indicate a structural surplus.

Source: Department of Finance, *The Fiscal Plan* (Ottawa, February 1984), Tables B-1, B-2.

Department of Finance.[20] It shows two sets of figures based on two different assumptions regarding the rate of growth of capacity output. Both calculations indicate a fall in the deficit from 1978 to 1981. This fiscal tightening certainly slowed the increase in aggregate demand for Canadian goods and services, but since much of it occurred between 1978 and 1979, its effects on the 1981–82 recession may have been relatively minor.

One final factor that should be taken into account is the change in the dispersion of aggregate demand across different sectors in the economy. The large changes in the relative prices of energy and basic commodities shifted demand away from Western Canada. The rise in real interest rates shifted demand away from the relatively capital-intensive goods-producing sector. The level of GDP in goods-producing industries during the 1982–84 period was 4.6 percent less than in 1980–81, while in service-producing industries it was 2.9 percent more.

This change in the pattern of aggregate demand is the one significant factor that has tended to raise the natural rate of unemployment in Canada. But it would be a mistake to think that the 1981–82 recession was mainly the result of changes in the structure, rather than in the level, of aggregate demand, because the recession was not restricted to a few sec-

[20]The inflation adjustment corrects the debt-service component of the deficit to include only *real* interest costs. The structural deficit also differs from the actual reported deficit because it has been adjusted for changes in the government's tax revenues and expenditures that are attributable to cyclical changes in the level of economic activity, rather than to changes in tax rates or spending programs.

tors. From 1981 to 1982, output and employment fell in all regions and in both service- and goods-producing industries. From the prerecession peak of the second quarter of 1981 to the trough of the fourth quarter of 1982, the rate of capacity utilization fell in all five major categories of industries and in all 20 of the sub-industries of manufacturing listed by the Bank of Canada. GDP was higher in December 1982 than in June 1981 in only one of 11 broad industry groups listed in the *Bank of Canada Review*, and that one — public administration and defense — is dominated by the government sector.

Furthermore, since goods-producing industries are more heavily influenced by international competitiveness, one of the most obvious changes in relative prices accounting for the relative slowdown of these industries is the real appreciation of the Canadian dollar. This is a relative price whose increase is attributable to Canadian monetary policy rather than to any change in the configuration of relative prices in world markets.

In summary, there is no shortage of nonmonetary factors that helped to make the 1981–82 recession so severe. But it is important to remember that even if those nonmonetary factors had been absent, Canada's monetary deceleration was so sharp that it almost certainly would have produced a massive recession by itself.

Recovery

1983–84

The recovery in 1983–84 was caused by an increase in the demand for Canadian exports, a revival of personal consumption expenditures, and expansionary fiscal policies of Canadian governments.

The most significant of these developments was the increase in demand for Canadian exports. The main reason for this increase was the strong growth of the U.S. economy during the 1982–84 period. Canadian real exports were 6.4 percent higher in 1983 than in 1982, accounting for over half the growth in real GNP between the two years. Between 1983 and 1984, the difference in U.S. and Canadian growth rates increased. This, combined with a small real depreciation in 1984, allowed Canadian real exports to rise by 19.5 percent from 1983 to 1984. The increase in real exports between those two years was even more than the increase in real GNP.

The revival of personal consumption expenditures was stronger than one would have expected on the basis of the increase in personal disposable income that took place in the recovery. The savings ratio, which had risen during the recession, fell to .128 in 1984 from .152 in 1982.

As for fiscal policy, Table 15 shows that the inflation-adjusted structural deficit of the consolidated government sector went up by almost 1.5 percent of GNP from 1981 to 1982, and a continuing increase was projected into 1984. Deficits have serious implications that make them undesirable in the long term, but they were probably useful in helping Canada recover from the 1981–82 recession by stimulating the demand for Canadian goods and services.

Despite the stimulus from these three sources, the recovery still had a long way to go by the end of 1984. The weakness in the recovery showed up mainly in investment expenditures. Normally, investment plays a leading role in recovery. But in this case, it was weak throughout 1983 and 1984. The level of real gross investment did not recover to its prerecession peak until the first quarter of 1985, almost four years later.

The weakness of investment demand was attributable partly to the continuing financial difficulty of many Canadian borrowers, which made them reluctant to undertake new capital expenditures, to invest in new housing, and to increase employment, and which made banks and other intermediaries continue their unwillingness to extend credit.

Part of that weakness was also attributable to the continued lack of confidence in Canadian government policies. Very little was done over the 1982–84 period to restore the confidence that had been lost as a result of the NEP, FIRA, and the attempt at partial tax reform contained in the November 1981 federal budget.

The continued weakness of demand in world commodity markets was also important in depressing the demand for investment.

The most significant factor that kept the recovery from being stronger probably was the continuation of monetary restraint through to late 1983 or early 1984. As Figure 2 (in Chapter 3) indicates, by the second half of 1983, the growth of broadly defined money had come almost to an end by most measures and had even turned negative by some.

Figure 2 also reveals that M1 had a burst of rapid growth from the fourth quarter of 1982 to the fourth quarter of 1983, one which does not show up in any of the broad aggregates. This burst undoubtedly is attributable to the large decline in nominal interest rates. Table 13 shows that short-term rates fell almost 800 basis points over the year starting after the second quarter of 1982. The most plausible explanation for this episode is that the fall in inflation brought down short-term inflation expectations in both Canada and the United States, which, in turn, caused nominal rates to fall. This raised the demand for M1 much more than for the less interest-sensitive broader aggregates.

It would be a mistake to interpret this burst in M1 growth as an expansionary move on the part of the Bank of Canada. The Bank merely accommodated a shift in people's demands for M1 relative to M2 induced

by falling inflation. If it had not done so, the Bank would have had to follow an even more restrictive policy and the broad aggregates would have decelerated even more than they did.

It was because of this continued monetary deceleration that high U.S. real interest rates were so harmful to the Canadian recovery. If the growth of broadly defined money had stopped its fall at the end of 1982 or even sooner, instead of in late 1983 or early 1984, the high U.S. interest rates would have resulted in a large depreciation of the Canadian dollar and a less pronounced increase in Canadian real interest rates. The depreciation might not have made Canadian exports grow much more rapidly than they did, because many export industries were beginning to operate near capacity by 1984 and because increasing sales to the United States might have provoked a bigger protectionist reaction that country. But some export industries — notably the forest industries — had considerable excess capacity, and by depreciating (or by appreciating less) against non-U.S. currencies, Canada might have sold more in other countries.

A real depreciation also would have dampened the over 14 percent rise in real imports that acted as a strong brake on the recovery in 1984. And it would have helped to stimulate investment and employment by dampening the rise in relative unit labor costs. A moderation in interest rates also would have had a positive effect on investment. And the overall effect of easier money would have been to relieve the financial distress that continued to afflict many Canadian borrowers.

Instead of counteracting the rise in U.S. interest rates by depreciation, the Bank allowed real appreciation to continue through to early 1984 and allowed real interest rates to rise by as much as in the United States. In the fourth quarter of 1983, the IMF measures of Canada's real exchange rate, using wholesale prices and value-added deflators, were each 4.8 percent higher than they had been two years earlier. Canada's long-term real interest rate rose over the same period by 4 percentage points, the same as the rise in the analogous measure in the United States.[21]

A sudden monetary deceleration has its real effects because prices decelerate more slowly than the money supply. What matters for aggregate spending is the real quantity of money. Measured, say, by M2 and the CPI, this real quantity did not just slow down but actually fell from 1981 to 1983, because those were two years in which M2 grew more slowly than the CPI. Sometime in 1984, real M2 started to pick up again but it still was less than it had been in 1981.

Table 16 shows the behavior of the real money supply. Generally speaking, all the broad aggregates exhibit the same pattern. By 1985 the

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[21]Long-term government bond yield minus CPI inflation, both as reported in *International Financial Statistics* (International Monetary Fund), various issues.

Table 16
Indices of Real Money Supply in Canada, 1980–85[a]
(1979 = 100)

	1980	1981	1982	1983	1984	1985
M2	107.97	110.45	108.93	108.88	108.92	114.63
M2+	106.25	107.80	104.98	106.22	108.27	114.09
M2++	103.38	103.45	104.39	107.97	110.93	117.43
M2-C	107.24	110.58	105.79	101.05	98.88	100.63
M3	106.14	106.68	101.02	96.80	94.87	96.53
M3+	105.39	105.81	100.42	98.42	98.59	101.55
M3++	105.38	105.00	103.17	106.63	111.18	117.43
Long-term equilibrium	103.00	106.09	109.27	112.55	115.93	119.41

[a]Real money supply is the nominal money supply divided by the Consumer Price Index.

Sources: *Bank of Canada Review*, various issues; and unpublished data from the Bank of Canada.

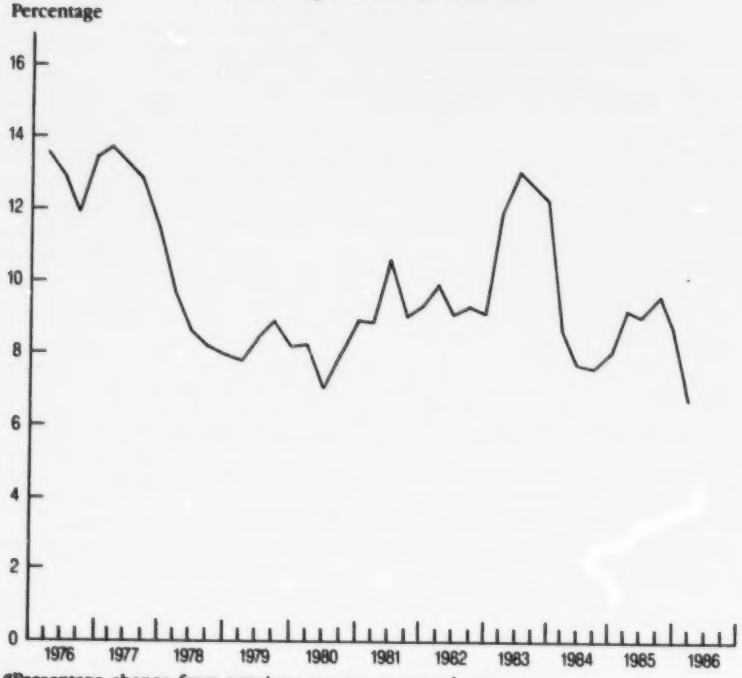
increases over 1979 ranged from -3.5 percent for M3 to 17.5 percent for M3++. As the bottom row of Table 16 shows, an assumed 3 percent per year growth of capacity output made the long-term equilibrium quantity of money grow by over 19 percent during that period.[22] So, in terms of Figure 1 (in Chapter 2), by 1985 there was a gap of 2 to 24 percent between actual and equilibrium real money supplies.[23] Measured by this gap, monetary restraint was not just maintained; it was intensified from 1981 through 1984.

Monetary restraint was an important reason why the recovery in 1983 and 1984 was weaker in Canada than in the United States. There were important nonmonetary reasons as well. The U.S. fiscal expansion was more sudden and more concentrated on defense purchases, with significant multiplier effects. U.S. borrowers were in better financial condition than their Canadian counterparts. The U.S. government, instead of discouraging investment, strongly encouraged it, especially with the investment incentives of the 1981 *Economic Recovery Tax Act*. Canada had a stronger foreign demand, but that was mainly a consequence of the stronger U.S. recovery.

[22]This calculation assumes a constant velocity. In fact, velocity has fallen according to all aggregates, despite the rise in nominal interest rates. Thus, the rise in the equilibrium quantity is probably understated.

[23]It should be noted that, generally speaking, the real quantity of money is not a reliable indicator of monetary policy because of the difficulty of knowing how its demand is being affected by changes in interest rates and temporary shifts. But the huge gaps shown in Table 16 indicate that something very abnormal was happening between 1979 and 1985, and it would be wrong to ignore this message.

Figure 4
Growth of U.S. M2, 1976–86[a]



[a]Percentage change from previous quarter at annual rates.

Source: *Money Stock Revisions* (Board of Governors of the Federal Reserve System), March 1986.

But these nonmonetary factors do not tell the whole story. From 1980 onward, while Canada underwent a huge monetary deceleration, there was no monetary deceleration in the United States. Instead, as Figure 4 reveals, the deceleration of M2 in the United States during the late 1970s was over by mid-1980. By 1982, M2 in the United States was growing in the 9 percent range and accelerating. Thus, by 1984, its real value was a full 16 percent higher than it had been in 1979, as it was in Canada. In other words, if the same 3 percent growth in capacity output is attributed to the United States as it has to Canada, there was *no* gap between actual and equilibrium levels of real balances in the United States by the end of 1984. This is an important reason why the U.S. economy was operating somewhere roughly in the neighborhood of full employment by the end of 1984 while Canada's, with its 5 to 22 percent real money gap, was operating some 7 to 10 percent below capacity.

1985 and Beyond

By early 1984, the long monetary deceleration had finally come to an end. The year-to-year growth rates of all the broad aggregates shown in Figure 2 (in Chapter 3) stopped falling in the first quarter of 1984. From then on, they began to rise through 1985. This long-awaited easing of monetary policy after four years of deceleration was reflected in the real depreciation that occurred in 1984 and in the fall in real interest rates that Table 13 seems to indicate may have started to occur in mid-1984. The real depreciation probably contributed to the surge of export demand in 1984.

The 1984 monetary revival was, however, fairly moderate. Except for M3++, all the aggregates in Table 16 show that the real money gap continued to increase from 1983 to 1984. By the end of 1984, there still was not much evidence of a revival in investment demand. But in 1985, the monetary revival gathered strength. By the fourth quarter, the year-to-year growth rates of M2+ and M3+ had risen to 10.5 and 7.4 percent, respectively, both well above their values (6.5 and 2.3) of a year earlier. Table 16 shows that the real money gap finally started to close in 1985, at least according to most of the aggregates.

The continued revival of monetary expansion has been reflected in real interest rates and in real exchange rates. Both measures of the real interest rate in Table 13 stayed lower through 1985 than their 1984 peaks. The IMF effective exchange rate in 1985 was down to 102.7 from its 1984 average of 106.3. The Bank of Canada's G-10 rate fell over the same period to 75.6 from 79.3. Since the end of 1985, both rates have continued to fall. Canada's relative normalized unit labor cost, which had averaged 117.5 in 1984, was down to 108.5 by the fourth quarter of 1985. Over the same period, the IMF measures of the real exchange rate, in terms of wholesale prices and value-added deflators, were down by about 7 percent.

Both a revival of business confidence and the considerable progress Canadian corporations have made in balance-sheet readjustment have reinforced the easing of monetary policy since early 1984. Thus, despite a slowing in export demand resulting from the slowdown in U.S. real growth, the recovery in Canada gathered strength in 1985. Investment finally started to grow at a substantial pace: real gross investment grew by 5.5 percent between 1984 and 1985. The unemployment rate, which was painfully slow to decline from its 1982 peak, is now starting to fall significantly.

If the current revival of monetary expansion continues, there is reason to believe that the real money gap soon will close and that the Canadian economy will return to full employment. If so, then it may soon be time for the Bank of Canada to refocus its efforts on the long-term problem of inflation, although continuing high unemployment and the recent fall in oil prices probably will keep inflation down for some time to come.

5

The Conduct of Monetary Policy, 1982–85

By the end of 1985, the Bank of Canada had completed the first phase of a successful transition from high inflation — a reduction of the rate of monetary expansion to a range consistent with long-term price stability. It also had begun the second phase — a temporary revival of monetary expansion, necessary to avoid a protracted period of deflation and subnormal activity. But that second phase was long in coming. The real money gap that had been opened up as part of the fight against inflation continued to grow until sometime in 1984, and only began to be closed noticeably in 1985.

During the same period, the Bank's strategic transition from Gradualism to an alternative policy also went through two phases. The first was a shift in focus away from monetary aggregates and toward exchange-rate stabilization. This shift in focus had its origins in the early years of Gradualism; it culminated in the 1981–83 period, when it led the Bank to abandon Gradualism and to permit a severe monetary deceleration. But starting in 1982 or 1983, the Bank's strategy entered a second phase, in which it gradually de-emphasized exchange-rate stabilization. Since then, the Bank has been moving toward a policy that looks more like Adaptive Monetary Control.

This chapter describes the Bank's performance in terms of the two transitions — from high inflation and from Gradualism — and analyzes the interrelations between them. In particular, I argue that the severity of the monetary deceleration is attributable to the Bank's commitment to exchange-rate stabilization, and that the lateness of the monetary revival is attributable to the Bank's reluctance to alter that commitment.

The Transition to Lower Inflation

The previous chapter outlined the role of monetary policy in reducing inflation. The Bank's tougher stance in 1981 added force to the monetary deceleration that had started sometime in early 1980. This deceleration, by helping to create the 1981–82 recession, was an important factor in bringing inflation down so suddenly in 1982. Helped by the other factors that induced the recession, the Bank thus accomplished the first phase of a successful transition to a long-term equilibrium with price stability. By early 1984, the rate of monetary expansion was low enough to be roughly consistent with long-term price stability. By the end of 1984, the

rate of Consumer Price Index (CPI) inflation over the previous year had fallen to below 4 percent.

But three years after the onset of the recession, the Bank had only just begun the second phase of this transition — the elimination of the excess capacity created in phase one. The rate of inflation, predictably, had not fallen as fast as the rate of monetary expansion. As a result, the real quantity of money in 1984 was still well below its long-term equilibrium value. This real money gap was one of the main reasons for continuing high unemployment in Canada.

As was explained at the end of Chapter 2, once monetary expansion has been reduced to a noninflationary rate, there are two ways to eliminate the real money gap. One way is to wait until there is enough unemployment and excess capacity to generate a long period of deflation, letting a fall in the price level raise the real value of money up to its equilibrium path. The other way is to allow a temporary burst of money growth to do the job without waiting for deflation. Common sense and historical experience suggest that the latter is the only sensible strategy. Not only should monetary deceleration come to an end but it should be replaced temporarily by a period of excess monetary expansion, a period long enough to close the real money gap. This monetary reacceleration must be temporary; if it is allowed to go on, inflationary pressures eventually will be revived and the gains made in the fight against inflation will be thrown away.

The monetary revival of the 1984–85 period indicates that progress is now being made to close the real money gap and, thus, to complete the second phase of the transition. At first, the progress was very slow. In terms of $M2^+$, the gap was still higher in 1984 than in 1983 — 7 percent of the actual quantity of real money in 1984, compared with 6 percent in 1983. But the revival was quite vigorous in 1985, when the $M2^+$ gap fell to 4.5 percent.

The monetary revival temporarily may have slowed the decline in inflation. But it also has contributed to a revitalization of the recovery from the 1981–82 recession. It seems that the real money gap may be closed sometime in 1987 and that the economy is now gradually on its way back toward full employment.

Even after the real money gap has been closed, it probably will take some time before the transition is complete. Although recovery is proceeding, no one knows how long it will take before full employment is reestablished. And although the rate of CPI inflation was down to 4 percent by the end of 1985, that is still a long way from price stability. At 4 percent inflation, the purchasing power of the dollar will fall to 6.5 percent of its original value within the lifetime of a person who lives to be 70.

The Strategic Transition

The End of Gradualism

When the Governor of the Bank of Canada announced in November 1982 that the Bank was no longer using a target range for M1 growth, it came as no surprise to anyone who had been following events. M1 had fallen a full 10 percent below the midpoint of its target range in late 1981, and by the end of 1982, it was still lower than it had been in mid-1981. Meanwhile, Bank officials had been discussing publicly the problems of monetary targeting for some time.[1] It was already clear that Gradualism was dead.

The change from Gradualism that had taken place by 1981 was not just a move toward the more restrictive stance that made monetary deceleration so powerful. It was also a change of emphasis from stabilizing money growth rates to stabilizing exchange rates. This change in emphasis had been taking place for a long time while the Bank was still officially pursuing Gradualism. Courchene points out that, ever since 1978, the Bank had been giving more priority to exchange-rate stabilization than was consistent with monetary targeting.[2]

The Bank had been led to give more emphasis to exchange-rate stabilization by problems that had arisen under Gradualism as early as 1976. That was the year of a big downward shift in the M1 demand function. Initially, the Bank accommodated the shift by letting M1 fall below the target range. In 1977, the Bank had to decide whether to allow that M1 shortfall to remain and to adjust downward the base of its target range, which would risk the credibility of its resolve to stick to announced targets, or to reflate back into the old target range and risk adding to inflationary pressures. It opted for the latter, although as soon as M1 had been brought up to the lower bound of its target range, the Bank adjusted the target growth rates downward. By 1978, the Bank realized that it had erred. The demand function for M1 really had shifted, and the Bank's failure to keep the supply of M1 down to offset fully that shift had added to inflationary pressures. In 1977, the Canadian dollar underwent a huge depreciation, and by 1978 inflation was starting to rise again.

Having been led into error by a commitment to monetary targets, the Bank decided to reassess that commitment. Meanwhile, it was worried that depreciation of the Canadian dollar was going to defeat the ultimate objective of bringing down inflation. The Bank then decided to pay less

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[1]For a more detailed discussion of these events, see Thomas J. Courchene, *No Place to Stand? Abandoning Monetary Targets: An Evaluation* (Toronto: C.D. Howe Institute, 1983).

[2]Thomas J. Courchene, *Money, Inflation, and the Bank of Canada, Volume II: An Analysis of Monetary Gradualism, 1975–80* (Montreal: C.D. Howe Institute, 1981).

attention to keeping M1 on target and more attention to avoiding depreciation.

The Bank's attention, at least during the first few years after 1978, focused mainly on the Canadian-U.S. dollar exchange rate rather than on any weighted average. It seems reasonable to suppose that the Bank decided to take a free ride on the relatively greater success that the United States was having in the fight against inflation.[3] The Bank has never acknowledged such a motive, but, as the Governor himself said:

> Such a policy guide [exchange-rate targeting] in effect transfers much of the responsibility for the basic direction of monetary policy to a country or group of countries that are of great economic importance to the country in question....[It] ensures pretty much the same inflation performance over time as the country or countries with which the exchange-rate link has been established.[4]

The increased volatility of U.S. interest rates that began in late 1979 and that continued for several years added another reason for this shift in emphasis. The Bank reasoned that a temporary increase in U.S. interest rates would cause a large depreciation of the Canadian dollar if M1 were kept on target. The depreciation eventually would cause a temporary rise in the Canadian inflation rate, which might turn into a prolonged wage-price spiral.

The rise in the price level caused by this depreciation ultimately would increase the nominal quantity of money demanded; thus, to keep M1 from rising above target, the Bank eventually would have to raise interest rates anyway. So, the Bank argued, it would make more sense to raise interest rates right away, nipping the inflation in the bud. The immediate rise in interest rates would make M1 fall below target, but such a temporary violation of monetary targets was preferable to allowing an inflationary depreciation.

During the late 1970s and early 1980s, the Bank also became concerned with the volatility of exchange-rate expectations. Changes in these expectations could work like changes in U.S. interest rates to depreciate the Canadian dollar if a monetary target was adhered to. Also, if people lowered their expectations of the future value of the dollar every time they saw a depreciation, then the depreciation initiated by a rise in U.S. interest rates could become amplified — technically, it could

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[3]This interpretation of the 1976–78 era is substantially that of Courchene, in Ibid.
[4]Gerald K. Bouey, "Monetary Policy — Finding a Place to Stand" (The 1982 Per Jacobssen Lecture, Toronto, September 5, 1982); reprinted in *Bank of Canada Review*, September 1982, p. 13.

"overshoot" its equilibrium value. A policy of exchange-rate stabilization would keep such changes in expectations from affecting the rate of inflation.[5]

Thus, the Bank's policy after 1978–79 consisted of two important tactics: (a) resist any substantial long-term depreciation of the Canadian-U.S. dollar exchange rate and (b) resist short-term fluctuations in that rate caused by temporary changes in U.S. interest rates or in the state of exchange-rate expectations.

For the first few years of this new policy, the Bank was able to stay officially committed to Gradualism, although it had made clear to the Canadian public as early as April 1978 that it was concerned with stabilizing the Canadian dollar exchange rate as well as with targeting M1.[6] Although monetary targeting and exchange-rate stabilization are not generally compatible, the conflict between them did not manifest itself until 1981.

It seems that the run-up in U.S. inflation in 1979 and 1980 allowed the Bank to keep broadly defined money growing at rates in the 15 to 20 percent range without depreciating the Canadian dollar. Meanwhile, the rise in nominal interest rates from 1978 to 1980, combined with the downward shift in the demand function for M1, kept this monetary expansion from showing up in M1, which stayed more or less on target. Just as the burst of M1 growth in 1982–83 induced by falling nominal interest rates did not signify any easing of monetary policy, so the gradual fall in M1 growth from 1978 to 1980 did not signify the application of any anti-inflation pressures.

This temporary compatibility between Gradualism and exchange rate stabilization was brought to a sudden end in 1981. The end of the burst of U.S. inflation, the sharp rise in U.S. interest rates, and a crisis of confidence in Canadian economic policy combined to put downward pressure on the Canadian exchange rate. At this point, the Bank had to choose between Gradualism and exchange-rate stabilization. It decided for exchange-rate stabilization, even though this meant applying an enormous amount of disinflationary pressure on the Canadian economy, enough perhaps to cause a serious recession.

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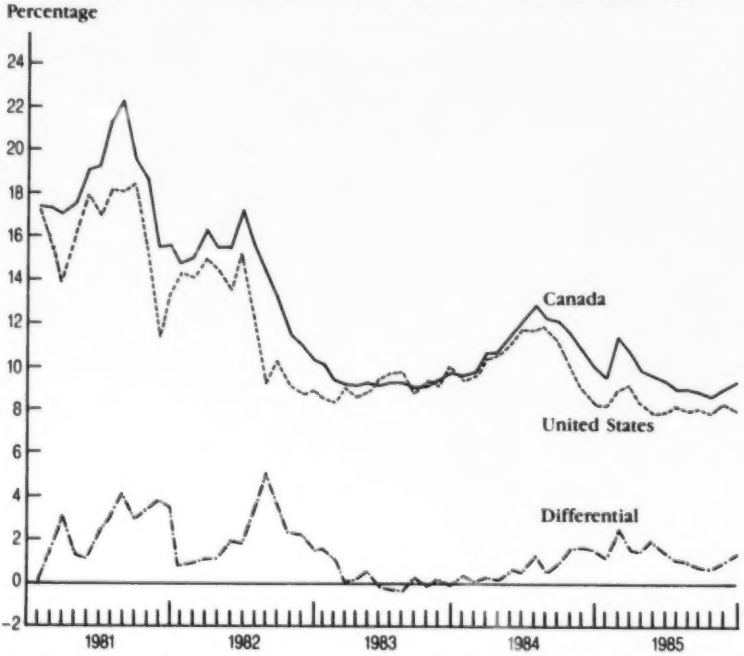
[5]This interpretation of the Bank's attitude to fluctuations in U.S. interest rates and to volatility in expectations is drawn from Gordon Thiessen, "The Canadian Experience with Monetary Targeting," in *Central Bank Views on Monetary Targeting* (New York: Federal Reserve Bank of New York, 1982); and from Charles Freedman, "The Effect of U.S. Policies on Foreign Countries: The Case of Canada," in *Monetary Policy Issues in the 1980s* (Kansas City: Federal Reserve Bank of Kansas City, 1983).

[6]In an April 3, 1978, press release, the Bank stated that it "was giving high priority in its conduct to the external value of the Canadian dollar" (reprinted in *Bank of Canada Review*, April 1978, p. 15).

Figure 5
Canadian and U.S. Short-Term Interest Rates, 1981–85



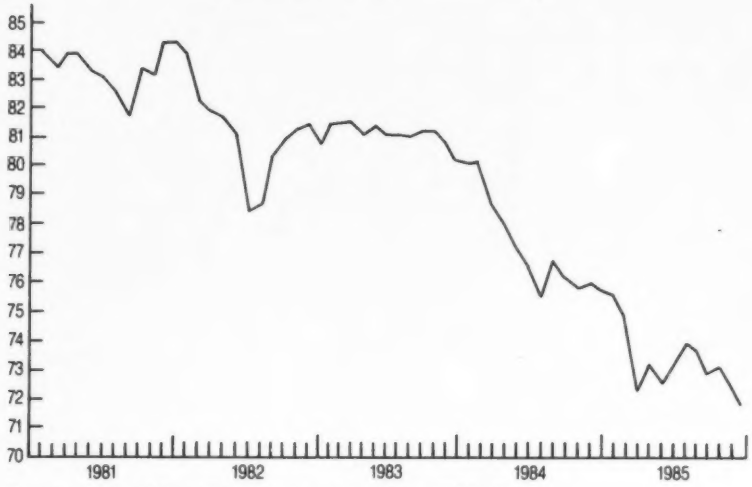
Source: *Bank of Canada Review*, various issues, Table F1. Canadian 90-day prime corporate paper and U.S. 90-day commercial paper rates.

As Figure 5 shows, the Bank allowed Canadian interest rates to rise much more than U.S. rates. By mid-1981, Canadian short-term rates were over 22 percent and the differential was over 4 percentage points. As Figure 6 shows, the Canadian-U.S. dollar exchange rate did fall somewhat in the summer of that year, but by November it was even higher than it had been at the beginning of the year. The Bank had not just resisted the depreciation, it had turned it into an appreciation. Meanwhile, the run-up in Canadian interest rates gave a strong impetus to the monetary deceleration that had started slowly in late 1979 or early 1980.

Stabilization of a Weighted-Average Exchange Rate

The 1981 run-up of Canadian interest rates signaled the end of Gradualism, but it left people wondering exactly what strategy the Bank would adopt next. Obviously, the Bank was resisting depreciation of the

Figure 6
Canadian-U.S. Exchange Rate, 1981–85
(Canadian dollar in U.S. cents)



Source: ***Bank of Canada Review***, various issues, Table 11.

Canadian-U.S. dollar exchange rate. Bank officials went to considerable lengths in 1982 to inform the Canadian public of the need to do so in order to defeat inflation. But it was hard to know just how strongly the Bank was going to resist or what it planned to do when there was no depreciation to resist.

The Bank made it clear that it had no predetermined "target" value in mind for the Canadian-U.S. dollar exchange rate. In March 1982, in reference to the 1981 run-up of U.S. interest rates, Governor Bouey told a Senate committee that "our reactions were not motivated by a fixation on maintaining any particular exchange rate."[7] Later, he pointed out that "the Bank has not adopted the exchange rate for the U.S. dollar as some kind of a monetary target."[8]

Thus, the Bank apparently was willing to let the dollar drift. It also was willing to let the dollar fluctuate somewhat in the short term in response to movements in U.S. interest rates or the state of exchange-rate expectations, as it had for a short time in mid-1981. In September 1982, the Governor explained: "On a number of occasions over the past three

[7]***Bank of Canada Review***, April 1982, p. 12.
[8]Bank of Canada, ***Annual Report 1983***, p. 8.

years or so the Bank of Canada has acted to moderate the effect on Canadian short-term rates of sharp movements in corresponding rates in the United States and has allowed some of the pressure to be taken by the exchange rate."[9]

While the Bank was open about this policy of resisting depreciation, no one outside the Bank still knew in 1982 and 1983 how much long-term drift and short-term fluctuation the Bank was willing to tolerate. It was suspected that no one inside the Bank knew either. It seemed that the Bank was determined to keep up monetary restraint until inflation broke; that in the meantime, it would judge on a month-to-month basis how hard it would have to resist depreciation in order to achieve this objective; and that it was not looking much beyond this immediate objective.

In September 1984, the Bank published a revealing article that made no explicit reference to monetary policy.[10] Instead, its purpose was to describe the Bank's Group-of-Ten (G-10) weighted-average exchange rate, and to publish data on the rate for the first time. These data, which are plotted in Figure 7 and updated to the fourth quarter of 1985, show that following a 20 percent depreciation from 1976 to 1978, the G-10 rate had remained within a band around 81.5 between the last quarter of 1978 and the first quarter of 1984. Whether the Bank intended it or not, its policies over that period resulted in something very close to a fixed G-10 exchange rate.

The width of the band is larger than that of a fixed exchange rate under the old Bretton Woods system. The quarterly data vary between 80.1 and 82.9 — that is, between 1.7 percent above and below the median value of 81.5. Monthly data reveal departures from 81.5 of as much as 3.6 percent. Weekly and daily departures have been even greater. But even the monthly data reveal only five months out of the 66 when more than a 2 percent departure was allowed. There were never more than two consecutive months with a departure of 2 percent or greater.

The G-10 rate assigns 82 percent of its weight to the U.S. dollar.[11] The other 18 percent goes to European currencies and the Japanese yen. Thus, one way of interpreting the absence of drift in the G-10 rate is that the

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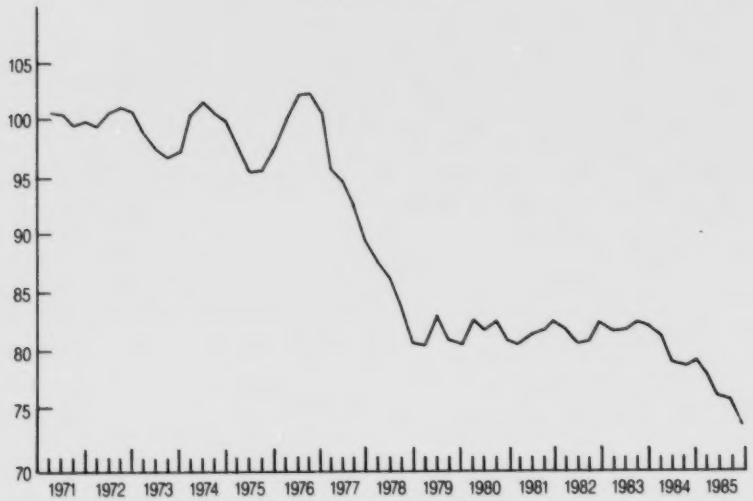
[9]Gerald Bouey, Remarks to the 53rd Annual Meeting of the Canadian Chamber of Commerce, Ottawa, September 21, 1982; reprinted in *Bank of Canada Review*, October 1982, p. 6.

[10]"Technical Note: A Weighted-Average Exchange Rate Index for the Canadian Dollar," *Bank of Canada Review*, September 1984, pp. 119–124.

[11]The weights are:

United States	.818	Italy	.012
Japan	.060	Netherlands	.011
United Kingdom	.042	Belgium	.009
West Germany	.024	Sweden	.005
France	.014	Switzerland	.005

Figure 7
G-10 Weighted-Average Exchange Rate, 1971–85
(1971 = 100)



Source: ***Bank of Canada Review***, various issues, Table 11.

Bank resisted long-term depreciation against the U.S. dollar more than did other central banks. While European and Japanese currencies depreciated against the U.S. dollar, the Canadian dollar did so only by 18 percent as much.

It is possible that the remarkable absence of drift in Canada's G-10 rate did not result from any conscious targeting effort by the Bank. It may have been an accident that the Bank's resistance to depreciation against the U.S. dollar was just enough to keep the G-10 rate stable, given the independent reactions of other central banks to U.S. developments. Perhaps if these central banks had reacted differently, the Bank would have continued to resist depreciation against the U.S. dollar just as strongly as it did, and the G-10 rate then would have behaved quite differently.

On the other hand, it also seems plausible that the Bank at least partly judged how strongly to resist depreciations by looking at the G-10 rate, or some similar rate. The Bank could not have been using the precise G-10 rate that it published in September of 1984 during the whole period from 1978 because the weights in that rate were chosen to represent the proportion of Canadian merchandise trade during the 1977–81 period. But any similarly constructed weighted-average rate that assigned roughly 80 percent of its weight to the U.S. dollar would have behaved rough-

ly the same as did the G-10 rate.[12] The Bank certainly knew that the Canadian dollar was depreciating less than were other currencies against the U.S. dollar and, hence, that such a weighted-average rate must have been relatively stable over the period.

Whether or not stabilizing the G-10 rate was a conscious objective of monetary policy over this period, there is no doubt that it was the outcome of monetary policy. The Bank acted as if it were operating a fixed exchange rate with wide bands. When we turn to the question of why Canada's monetary deceleration continued for as long as it did, the fact that Canada had a *de facto* fixed exchange rate, whether intentional or not, will play an important role.

The Changing Stance of Policy after 1981

The policy of resisting depreciation against the U.S. dollar continued beyond 1981. But as unemployment rose and inflation began to fall, the Bank's reaction to depreciation slowly changed and its desire to enforce monetary restraint eventually turned into a willingness to undertake the monetary revival that started in 1984–85.

After the experience of 1981, the Bank's resistance to depreciation was tested again in 1982. U.S. interest rates started rising in late 1981, as they had earlier in the year. The Bank responded, as usual, by letting some of the pressure come out on the exchange rate and some on interest rates.

Figure 6 shows that the Canadian dollar fell by 2 cents against the U.S. dollar between December 1981 and February 1982. Meanwhile, the G-10 rate fell by one point. The Bank did not raise interest rates noticeably, but Figure 5 shows that the 90-day commercial paper rate did stop falling. The differential over U.S. rates was allowed to fall close to zero. In fact, it turned negative briefly in February 1982 for the first time in several months.

Speculative pressure soon began to build against the Canadian dollar. The inflation rate was higher in Canada than in the United States, confidence in Canadian policies was generally low, and many people, including provincial premiers, were urging the federal government to reduce interest rates regardless of the exchange-rate consequences. For all these reasons, there was a widespread belief in the foreign exchange market that the Canadian dollar was about to depreciate.

By May 1982, this state of expectations was having a large effect on the value of the Canadian dollar. The Bank responded by raising the interest differential to 2 percentage points, but both the Canadian-U.S. dollar exchange rate and the G-10 rate continued to fall.

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[12]For example, the nominal effective rate for Canada published by Morgan Guaranty Trust Company looks quite similar.

In June and July, the speculative pressure seemed to come to a head. The Canadian dollar fell to less than U.S.$0.775 at the end of June, down 6 cents from the beginning of the year. The G-10 rate averaged only 78.5 in June and 79.1 in July.

In August, this crisis came to an end when U.S. interest rates declined sharply and the Bank allowed the interest differential to rise to 4.5 percentage points. By the end of August, the G-10 rate was back around 81 and the Canadian dollar had risen to roughly U.S.$0.81, approximately 3 cents lower than at the beginning of 1982 and where it was to remain for over a year.

In many ways, Canadian financial-market events of 1982 represented a repeat of 1981. In both cases, a run-up of U.S. interest rates turned into a crisis of confidence in the Canadian dollar. In both cases, the Bank responded initially by allowing some depreciation, then later by opening up a large differential to end the speculation.

There are, however, several indications of a small but significant change in 1982. The Bank's initial resistance to depreciation was considerably less in 1982 than in 1981. In 1982, the differential was kept near zero for longer, and the Canadian-U.S. dollar exchange rate was allowed to fall by more than it did in 1981. By the end of the 1982 episode, the Bank had allowed a 3 cent depreciation against the U.S. dollar, rather than the small appreciation of 1981. In both cases, the G-10 rate was back near its average value of 81.5 after the crisis was over, but in 1981 it had never been allowed to depart from that range.

For all these reasons, it seems that the Bank took a less restrictive stance in 1982 than it had in 1981. It is reasonable to suppose that this change reflected the fact that unemployment was becoming a much more important problem than it had been in 1981. There were still few signs that inflation was starting to come down in mid-1982, but such a deep recession was bound to have an effect on inflation sooner or later. In short, the importance of fighting inflation relative to that of raising the level of real activity was less in 1982 than in 1981.

In 1983, the Bank's resistance to depreciation of the Canadian-U.S. dollar exchange rate was not tested again, and it was hard to judge the stance of policy. U.S. interest rates had fallen precipitously in the summer of 1982. Initially, the Bank used the occasion to raise the differential and quell speculation against the Canadian dollar. But beginning in late 1982, Canadian rates were allowed gradually to come down; by early 1983, the differential reached close to zero. The Canadian-U.S. dollar exchange rate remained more or less constant throughout the third quarter of 1982 and the first three quarters of 1983.

With no exchange-market crisis to occupy it, the Bank obviously was having to think beyond the question of how firmly to resist depreciation.

But the stance it would take remained unclear. Inflation had come down rapidly by early 1983, and although no one was sure how long it would stay down, this good news obviously made the Bank give more weight to the problem of promoting recovery. But the recovery had already begun, making it less urgent for the Bank to adopt a more expansionary policy.

The Bank made little effort to inform the public of its stance. Following the massive public relations exercise of 1982, statements by Bank officials on the subject of monetary policy suddenly ceased in 1983. In 1982, the *Bank of Canada Review* reprinted seven speeches, remarks, and statements dealing with monetary policy by the Governor and one by a Deputy Governor. In 1983 there was only one, in December.

By late 1983, there were signs that the Bank was adopting a more expansionary stance. The interest differential was very low, and the Canadian dollar was beginning to fall to the range of U.S.$0.80. But the Bank apparently was not yet prepared to countenance a major depreciation against the U.S. dollar. In November 1983, the Governor broke his nearly year-long silence on monetary policy with remarks that re-emphasized the Bank's commitment to bring down the rate of inflation. He warned that "any major depreciation of the Canadian dollar at this time would be much more likely to damage than to help our economic situation in that it would be strongly inflationary in an environment where confidence that inflation is under control is still so fragile."[13]

In 1984, the Bank's resistance to depreciation was tested once again. Another run-up in U.S. interest rates began in January 1984 and the Bank again responded by allowing the Canadian dollar to depreciate. The interest differential actually rose slightly, but it had started at a level close to zero; for the first four months of 1984, it was kept close to zero.

Meanwhile, the Canadian dollar fell below U.S.$0.79 in February, and continued falling until June. The G-10 rate also fell sharply; by June, it had been more than 1.7 percent below 81.5 for an unprecedented four consecutive months.

As had happened in 1981 and 1982, this initial decline in the exchange rate was followed by a speculative run on the Canadian dollar, fueled by speculation that the Bank might give in to pressures for lower interest rates. Again the Bank ended the speculation by allowing the interest differential to rise sharply.

Although the 1984 episode bears resemblances to those of 1981 and 1982, it also has some important differences. These differences make it clear that by 1984 there had been a major change in the Bank's attitude, a change toward a more expansionary policy stance.

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[13]Gerald K. Bouey, Notes for remarks to the Investment Dealers Association of Canada, Toronto, November 29, 1983; reprinted in *Bank of Canada Review*, December 1983, p. 23.

The most important difference in 1984 was that, this time, the episode had started, perhaps even as early as the fourth quarter of 1983, with a deliberate attempt by the Bank to reduce the interest differential. After U.S. interest rates had started to rise and the Canadian dollar had started to depreciate, the low interest differential was maintained for even longer than in 1982. And the eventual increase in that differential in 1984 brought it only one-half as high as in 1982.

Furthermore, although the overall depreciation of the Canadian-U.S. dollar exchange rate was about the same as in 1982, the 1984 episode marked the end of Canada's *de facto* fixed G-10 rate. Figure 6 shows that the G-10 rate finally left its former band around 81.5 and was stabilized around a value of 78.8 through most of 1984. Whether intentional or not, the Bank had permitted a devaluation of the G-10 rate for the first time in over five years.

The Bank acknowledged that this episode did indeed start with a deliberate move toward a more expansionary policy:

> The growth of spending in the economy proceeded at a moderate pace over the past year, consistent with the gradual improvement in economic activity and further gains in reducing inflation. In these circumstances, some reduction in the level of interest rates seemed to be consistent with maintaining a moderate trend of monetary expansion. And the operations of the Bank of Canada were oriented during 1984 to bringing about lower interest rates, so long as the progress we were making in bringing down our inflation rate was not threatened.[14]

But although the Bank was willing to acknowledge this shift in its policy stance, it was not willing to admit to any major shift in its attitude toward depreciation. A large part of the 1983 *Annual Report*, which came out in the midst of this episode, was devoted to asserting the Bank's resolve not to give up the fight against inflation. On the subject of currency depreciation, its main message was the same as in 1982. In particular, it expressed the conviction that "sharp downward movements of the exchange rate are inflationary....Policy ought therefore to provide resistance against [them]."[15] In a June 1984 speech, the Governor referred to the recent depreciation as an "unwelcome event" that the Bank "has certainly not wished to see" and warned that "I have never favoured depreciation where it can be avoided or at least limited."[16] The Governor's explanation that the Bank reacted

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[14]Bank of Canada, *Annual Report 1984*, p. 8.
[15]Bank of Canada, *Annual Report 1983*, p. 8.
[16]Gerald K. Bouey, Address to the Board of Directors of the Bank of Canada, Charlottetown, P.E.I., June 26, 1984; reprinted in *Bank of Canada Review*, July 1984, pp. 3–8.

to the run-up in U.S. interest rates partly by allowing a depreciation "for the time being" and partly by allowing interest rates to rise was a restatement of a position he had taken many times in the past, emphasizing again the continuity of policy.

In the 1984 *Annual Report*, the Bank referred to the episode as an example of the danger of pursuing too expansionary a policy. It focused mainly on the tactical problems of making even a moderate move toward monetary expansion:

> In Canada, fears during the first half of the year that the upward movement in U.S. interest rates might not be soon reversed led to strong downward pressure on the exchange value of the Canadian dollar even though Canadian interest rates moved up broadly in line with those in the United States. The operations of the Bank of Canada in managing the cash reserves provided to the financial system were designed through much of this period to moderate the pressure on domestic interest rates. However, as the exchange rate continued to move downward the Bank encountered stronger market resistance to its reserve management operations as investors in short-term securities sought to obtain a better interest return as protection against further declines in the Canadian dollar. Eventually, an interaction developed between the short-term money market and exchange market in which attempts to moderate interest rate increases led to speculative positions being taken against the Canadian dollar, and the resulting downward pressure on the exchange rate in turn intensified the upward pressure on Canadian interest rates.[17]

These statements give the impression that the Bank had tried applying a moderate amount of monetary stimulus, expecting that the stimulus would work mainly through a reduction in Canadian interest rates relative to those in the United States without causing a significant depreciation of the Canadian dollar against the U.S. dollar, and that the end result — a roughly unchanged interest differential but a lower exchange rate by the end of the year — had come as a nasty surprise.

It is hard to know exactly what to make of these statements. The Bank knows that, as was explained in Chapter 2, monetary stimulus in an open economy works by depreciating the currency as well as by reducing interest rates. It also knows that the exact combination of interest-rate decrease and exchange-rate decrease depends very much on the reaction of exchange-rate expectations and that because these expectations are so volatile, it should not be surprising to find that monetary stimulus sometimes leaves the interest differential unchanged.

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[17]Bank of Canada, *Annual Report 1984*, p. 18.

I am inclined to read these statements partly as an exercise in public relations. As it had many times in the past, the Bank made it clear in its 1984 *Annual Report* that it actually was aware of the effect that public perceptions of its own policies can have on the state of exchange-rate expectations. When it is trying to ease monetary policy without endangering the fight against inflation, the last thing the Bank wants is to set off a run on the Canadian dollar by even hinting at a relaxed attitude toward depreciation. But the Bank's statements probably also reflect a genuine apprehension of depreciation and its inflationary consequences. Without this apprehension, it would not be so wary of fueling speculation against the dollar.

Thus, it seems that the Bank started its move to monetary ease in late 1983 or early 1984, hoping that this would result mainly in lower interest rates rather than in depreciation. Given the unpredictability of expectations, the Bank must have known there was a significant chance that its hopes would be disappointed, but there was also a significant chance that they would be fulfilled. It obviously was willing to accept the depreciation that resulted, rather than to end the speculation as vigorously as it had in 1981 or 1982, but it was genuinely disappointed at the way things had turned out.

In short, although the stance of monetary policy had changed significantly by 1984, there were strong indications that the fear of depreciation that originally had led the Bank to replace Gradualism with exchange-rate stabilization still was playing a large role. After this episode, the Bank allowed the Canadian dollar to drift down to the range of U.S.$0.75 by the end of 1984. But during that time, the G-10 rate stabilized within a narrow band around 78.8.

In February 1985, just as the Bank's 1984 *Annual Report* was about to come out, another crisis hit the Canadian dollar. U.S. interest rates had begun rising in late 1984. Again, the Bank responded by raising Canadian interest rates and allowing some depreciation. But this time the depreciation was much swifter than before. By the end of February, the Canadian dollar had fallen to U.S.$0.72 and the G-10 rate had fallen to 76. What might have seemed like a devaluation of the G-10 rate in early 1984 turned out to have been no more than one step in a continuing depreciation. By this measure, the Bank now was clearly willing to countenance far more depreciation than it had in the past.

From mid-1985 to the end of 1985, there were further indications of the Bank's more expansionary stance. Over that period, the U.S. dollar depreciated considerably against most European currencies and the Japanese yen. If the Bank still had been stabilizing the G-10 rate, this downward movement of the U.S. dollar would have required the Canadian dollar to rise relative to the U.S. dollar. In fact, the Bank allowed the Canadian

dollar to depreciate even further than the U.S. dollar. By December 1985, the Canadian-U.S. dollar exchange rate had drifted down to U.S.$0.715, and the G-10 rate had fallen to 72.

The Two Transitions

This description makes it clear that by 1981, exchange-rate stabilization had replaced Gradualism as the Bank's main strategy. From 1982 through 1985, however, the concern with exchange-rate stabilization slowly began to give way to the objective of applying monetary stimulus to the economy.

This change in the Bank's strategy can be explained mainly as a reaction to the changing behavior of inflation and unemployment. In this sense, the continuing strategic transition from Gradualism cannot be understood without reference to the other transition: the transition from high inflation.

The course of the transition from high inflation, in turn, was affected by the Bank's changing strategy. The decision to abandon Gradualism completely in 1981 hastened the monetary deceleration that brought about the first phase of the transition from high inflation. By the same token, the Bank's slowness to abandon the attitudes that had led it, consciously or otherwise, to stabilize the G-10 exchange rate, had a lot to do with why it took so long to bring monetary deceleration to an end and, thus, to start the second phase of the transition.

There is evidence that the Bank intended to end the monetary deceleration as early as 1983. The November 1983 speech in which the Governor reaffirmed his commitment to fight inflation also contained the following passage:

> The appropriate objective of monetary policy in present circumstances is a rate of monetary expansion sufficient to accommodate increasing utilization of our economic resources in a context of increasing price stability. That is what the Bank of Canada has been trying to achieve, and in my judgement the rate of monetary expansion this year has been consistent with that objective. The Bank will continue to pursue the same objective.[18]

Although this paragraph is worded so as to convey the impression of continuity in policy, it does imply that the Bank's policy was not to let the deceleration continue. For if the rate of monetary expansion was consistent with its objectives in 1983 and the Bank intended to keep it consistent with the same objectives in 1984, the deceleration obviously would have to come to an end.

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[18]Bouey, Notes for remarks, November 29, 1983, p. 20.

Exactly when the Bank decided that the time had come to end monetary deceleration is not known for sure. But the Governor's November 1983 speech and the very low interest differentials shown in Figure 5 through much of 1983 suggest that it was sometime in that year. Furthermore, deceleration did end in late 1983 or early 1984. But policy was not loosened enough to start closing the real money gap until 1985.

The main reason why monetary deceleration in Canada was so powerful and why it was not reversed significantly until 1985 was the Bank's unwillingness to tolerate a substantial depreciation against the U.S. dollar. This unwillingness gradually diminished over the final three years of the deceleration, but still was exerting a powerful influence on policy in 1984.

To understand how this unwillingness to tolerate depreciation attenuated the deceleration, it must be remembered that U.S. real interest rates remained high throughout the 1981–84 period and that the aggregate demand for Canadian goods and services was weakened considerably by the collapse in investment demand in late 1981. As was explained in Chapter 2, under a fixed exchange rate, a fall in domestic spending or a rise in foreign real interest rates brings about a monetary deceleration, because both of these require the Bank to undertake restrictive operations to raise interest rates if Canada is to keep its exchange rate from depreciating.

It is instructive to compare the Canadian monetary deceleration in 1983 with the U.S. monetary revival that began in mid- to late 1982 and continued on through 1983. Both Canada and the United States had high real interest rates. Since 1980, both countries had experienced a large appreciation relative to European and Japanese currencies. But aggregate spending was much stronger in the United States because of that country's investment boom and relatively more expansionary fiscal policy.

The strong demand for goods and services in the United States was accompanied by a strong demand for credit to finance the spending. This demand for credit was largely responsible for the high U.S. real interest rates. The U.S. monetary revival in 1982–83 dampened the rise in U.S. real rates but was not strong enough to eliminate it.

The relatively weak demand for goods and services in Canada meant that there was much less upward pressure on Canadian interest rates coming from the demand for credit. In order to keep up with the high U.S. real rates, the Bank had to restrict the supply of credit; it had to undertake restrictive operations to reduce the rate of monetary expansion.

Under the circumstances, there was no way that the Bank could bring an end to monetary deceleration until it weakened its resistance to depreciation against the U.S. dollar. When it finally weakened in 1984, the deceleration came to an end. At first, the monetary revival was relatively mild, but when the Bank allowed further depreciation to occur in 1985, the revival finally began to gain strength.

Summary

The monetary deceleration that helped bring an end to the high inflation of the 1970s and early 1980s was brought about by a change in the Bank's strategy: a change in emphasis away from stabilizing narrowly defined money and toward stabilizing the Canadian-U.S. dollar exchange rate. The Bank's policy from the fourth quarter of 1978 through the first quarter of 1984 resulted in a *de facto* fixing of the G-10 exchange rate, a weighted-average rate that assigns 82 percent of its weight to the U.S. dollar. This policy resulted in a sharp deceleration of the Canadian supply of broadly defined money in 1981–82, because of the sharp increase in U.S. interest rates and the decline in Canadian spending which occurred at that time.

The same policy resulted in the prolongation of Canadian monetary deceleration until late 1983 or early 1984. The growth rates of all the broad monetary aggregates stopped falling in the first quarter of 1984, the same quarter in which the G-10 rate was allowed to fall significantly below its average value of the previous five-and one-half years.

Since 1982, however, the Bank's attitude toward the value of the Canadian-U.S. dollar exchange rate has been changing gradually. The monetary revival that started in 1984 and gathered force in 1985 took place because the Bank finally was willing to permit a substantial depreciation against the U.S. dollar.

In Chapter 3, it was argued that Gradualism was different in several fundamental respects from Adaptive Monetary Control. The policy of exchange-rate stabilization that succeeded Gradualism was even further from Adaptive Monetary Control, because it shifted the focus of policy away from monetary aggregates. The new policy succeeded in bringing about the monetary deceleration that Gradualism had failed to produce. But because it focused on exchange rates rather than on monetary aggregates, the new policy was unable to bring that deceleration under control.

It is still too early to tell just where the second phase of the Bank's strategic transition will lead.[19] But the fact that, since 1984, the Bank has allowed substantial depreciation of the G-10 rate and has succeeded in bringing the behavior of broadly defined money under control offers hope that it may be moving in the direction of Adaptive Monetary Control.

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[19]The 1985 *Annual Report* unfortunately had little to say on the Bank's overall strategy other than to reiterate the concern for fighting inflation and avoiding unwanted exchange-rate movements that had highlighted all of the Bank's annual reports since the end of Gradualism.

6

A Critique of the Bank's Rationale for Increasing Monetary Restraint

From mid-1982 until the end of 1984, the Bank of Canada's unwillingness to depreciate the Canadian dollar against the U.S. dollar led it to carry out an increasingly restrictive monetary policy. Although the Bank's attitude was evolving toward a less restrictive stance, the real quantity of broadly defined money continued to fall relative to its long-term equilibrium growth path. Monetary restraint thus was intensified despite the fact that unemployment remained high and inflation was falling. This chapter takes a critical look at the reasons that led the Bank to pursue such a restrictive policy. It concludes that the Bank's reasoning led it to make mistakes that could have been avoided if it had paid more attention to monetary aggregates, and if it had been guided more by the ideas underlying the principle of Adaptive Monetary Control.

Inflation as the Prime Objective of Monetary Policy

The Long Fight against Inflation

Perhaps the foremost reason why the Bank pursued such a severe policy was that, having struggled so hard against inflation, it did not want to give up the fight until it was absolutely sure that the enemy was dead, no matter what the cost. As the Governor himself put it, "[being] tolerant about inflation...will lead only to a resurgence of inflation and then, in short order, the need to go through something like the recent recession all over again. Who wants that?"[1]

One can understand the Bank's reluctance to risk all those gains with what might turn out to be a premature stimulation of the economy. But while intensifying restraint makes obvious sense when inflation is in the double digits and the unemployment rate is around 7.5 percent, it is far less defensible when inflation has fallen within a year to the 5 percent range and unemployment is over 12 percent.

In the 1982 *Annual Report*, the Governor warned that unless inflation was reduced, "it will accelerate. If the process is allowed to continue the final phase is hyperinflation." He also asserted that, in the context of 1982, a policy of "financial stimulation" would not buy any more employment,

[1]Gerald K. Bouey, Notes for remarks to the Investment Dealers Association of Canada, Toronto, November 29, 1983; reprinted in *Bank of Canada Review*, December 1983, p. 20.

at least "not more than very temporarily, not any longer."[2] Both of these assertions are extremely dubious. The first ignores the fact that many industrialized countries have had positive rates of inflation for decades with no tendency toward hyperinflation. The second is based on a "policy ineffectiveness" proposition against which there exists a great deal of empirical counterevidence. With the mass unemployment of 1982–83, the beneficial effects on employment from stimulating aggregate demand were likely to be even greater than usual. With so much excess capacity, not much of the stimulation would be dissipated by price increases. Such questionable assertions from an otherwise cautious and professionally competent agency suggest that, by early 1983, the single-minded concentration on inflation — which had been well-placed in 1981 — had begun to affect the Bank's judgment. The rest of this section discusses some of the questionable aspects of the Bank's rationale for its continuing tough stand against inflation.

Credibility

An important aspect of the Bank's reasoning concerned the direct effect that its own policy actions exert on people's expectations of inflation. From the beginning of Gradualism, the Bank placed a high priority on maintaining credibility by demonstrating its commitment to fighting inflation. In the period under study, the Bank invoked a concern with credibility to justify its unwillingness to ease monetary policy. In the 1982 *Annual Report*, the Governor stated that:

> When people have expectations or fears of high or rising inflation they tend to see in stimulative financial policy evidence that their expectations or fears are warranted. The actions that they then take to protect themselves push up costs and prices (including interest rates) and reduce the benefits to employment and output that the financial stimulation was undertaken to achieve.[3]

This statement again asserts the dubious "policy ineffectiveness" proposition. The problem with it is that it places too much weight on the direct credibility effect of policy changes on people's inflation expectations and not enough on the other sources of inertial inflation. For the credibility effect to work to this extent, the rate of inflation must respond very rapidly to accurate perceptions of monetary policy. But if inflation was that malleable, why had it taken so long to bring it down with the very policies that the Governor was arguing were most credible? In my opinion, it is

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[2]Bank of Canada, *Annual Report 1982*, pp. 6–7.
[3]Ibid., p. 6.

because the credibility effect is not that strong. Whatever accounts for the inertial inflation of costs and prices, it is not quickly changed by changed perceptions of policy, except perhaps in extraordinary circumstances.[4]

The Bank seems to be involved in a contradiction here. The belief that policy perceptions can have a rapid, direct effect on inflation and that the Bank's policies are, indeed, credibly committed to eliminating inflation is not jointly consistent with the observation, made elsewhere in the same report, "that our economic system has exhibited stubborn resistance to a reduction in the rate of cost and price inflation"[5] in the face of those very policies.

The 1983 Rise in Velocity

One of the reasons why the Bank allowed monetary deceleration to continue throughout 1983 was that the recovery was starting to occur anyway. The Bank judged that because 1983 was a year of vigorous recovery, monetary stimulus was not yet needed and might risk re-igniting inflation. Its judgment was questionable.

This was a year in which nominal-income targeting and monetary control would have led to different policy choices, because the velocity of circulation of money (the ratio of nominal spending to the money supply) rose (the velocity of M2 rose by 2.9 percent from 1982 to 1983). If the Bank had been focusing on broadly defined money, it would have seen that the time had come to start increasing the rate of monetary expansion. Instead, it chose to pay more attention to nominal income, which seemed right on target.

The Bank rationalized its choice partly by interpreting the rise in velocity as a downward shift in the demand function for broadly defined money, which should be accommodated by letting the supply of money continue to decelerate:

> It appears that relatively high interest rates and concerns about employment and income resulted in a smaller proportion of durable goods being purchased on credit and a larger proportion paid for from accumulated savings. Moreover, these concerns encouraged households to use available liquid assets to pay down existing consumer loans and residential mortgages. The net effect on financial institutions has been a sharp reduction in the growth of their personal and mortgage loan portfolios and of personal deposits.[6]

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[4]Thomas Sargent has argued that public perceptions of policy may be very important in bringing hyperinflation to an end (see "The Ends of Four Big Inflations," in Robert E. Hall ed., *Inflation: Causes and Effects* [University of Chicago Press for the National Bureau of Economic Research, 1982], pp. 41–97).

[5]Bank of Canada, *Annual Report 1982*, p. 10.

[6]"Monetary Aggregates: Some Recent Developments," *Bank of Canada Review*, January 1985, p. 13.

The problem with interpreting these events as a shift in the demand for money is that they are just what one would expect to see as a result of a shift in the supply — as the result of a monetary deceleration. The rise in loan rates and relative unavailability of credit caused by monetary deceleration persuade people to pay down their loans and run down their liquid assets.

No one knows exactly how much of the rise in velocity in 1983 was the result of a shift in demand but, in my opinion, the Bank should have been guided by the historical evidence that lends a strong presumption to the hypothesis of a stable demand function for broadly defined money. The vigorous growth of 1983 led many observers to expect that Canada was well on its way back to full employment. But these expectations were disappointed when growth began to falter in 1984. There is no doubt that the recovery would have been less disappointing had the Bank pursued a more expansionary policy in 1983. Had the Bank paid more attention to the monetary aggregates instead of to nominal spending and had it acted on the presumption of a stable demand function for broadly defined money, the second phase of the transition from high inflation would have been accomplished sooner.

Inflexibility of Canadian Wages and Prices?

One element in the Bank's thinking may have been the idea that wages and prices are not as flexible in Canada as in the United States and that because of this greater inflexibility, Canada needed a longer and more powerful dose of monetary restraint than did the United States to get rid of inflation. Specifically, when U.S. monetary expansion was revived in the second half of 1982, Canada could not afford to follow suit.

There is probably some truth to this idea. In 1981 and 1982, both wage and price inflation were considerably lower in the United States than in Canada. As a result, it would not have been wise for the Bank to allow as big a surge of M2 growth as took place in the United States in 1982.

But the fact that inflation was higher in Canada than in the United States in 1981–82 does not imply that it was less responsive to the recession's pressures. It was higher primarily because U.S. inflation had already reached its peak early in 1980 whereas Canada's continued to rise until mid-1981.

The earlier peak in U.S. inflation can reasonably be attributed to three factors:

- the United States allowed the world energy price increase in 1979 to feed through to domestic prices more rapidly than did Canada;
- the United States experienced a more severe recession in 1979–80 than did Canada due, in part, to the fact that, as a comparison of Figures 2 and

Table 17
Real GNP in Canada and the United States, 1979 and 1982
(billions of constant 1980 dollars)[a]

	Canada	United States
1979	$294.39	$2,639.6
1982	$293.72	$2,640.6

[a]In national currencies.

Source: *International Financial Statistics* (International Monetary Fund), various issues.

4 reveals, U.S. monetary policy in 1978 and 1979 was much tighter than Canada's; and

- the relatively larger U.S. currency appreciation since 1980 has been exerting relatively more downward pressure on inflation.

None of these factors implies greater flexibility of U.S. wages and prices. In fact, there is evidence that the 1981–82 recession reduced Canadian inflation more than U.S. inflation, as one might expect if the degree of flexibility were the same in both countries and given the greater severity of the recession in Canada. One study notes, for example, that the fall in the rate of increase in new wage settlements from 1981 to 1982 was greater in Canada than in the United States by an amount roughly in proportion to the greater severity of Canada's recession.[7] And the recalculation by DeVries and Baldwin referred to in Chapter 4 shows that if the cost of homeownership is measured in the same way in the two countries, the fall in the year-to-year Consumer Price Index (CPI) inflation rate from mid-1981 until the end of 1982 was greater in Canada than in the United States.[8]

It might even be argued that by the end of 1982, Canada's position to try monetary expansion was almost as good as that of the United States. The continued effect of the 1979–80 and 1981–82 recessions had applied approximately the same amount of disinflationary pressure to the two countries. Table 17 shows evidence of this: in both countries, real GNP was almost exactly the same in 1982 as it had been in 1979. Furthermore, the DeVries-Baldwin recalculation shows that by the last quarter of 1982 Canada's year-to-year CPI inflation rate was within 1.2 percentage points of the U.S. rate. By March 1983, the gap had been eliminated.

[7]Craig Riddell, "The Responsiveness of Wage Settlements in Canada and Economic Policy," *Canadian Public Policy* 9 (1983): 12.

[8]Peter DeVries and Andrew Baldwin, "Impact of Different Homeownership Methodologies on Consumer Price Index Behaviour between Canada and the United States," *Canadian Statistical Review*, April 1985, pp. vi–xv.

Not all of this information was available in 1982. The reported year-to-year CPI inflation rate was still 2 points higher in Canada than in the United States at the end of 1982. Furthermore, new wage settlements were still generating larger increases in Canada than in the United States. Thus, to repeat, the Bank was wise not to copy the U.S. burst of monetary expansion. But nothing in this comparison of the two countries suggests that it was wise to let monetary deceleration continue through 1982 and 1983.

Fear of Exchange-Rate Fluctuations

Depreciation and Inflation

The main reason why the Bank was so reluctant to depreciate the Canadian dollar was a fear that this would have a direct effect on the rate of inflation. The Bank accepted that, in the long term, the rate of inflation is determined not by the exchange rate but by the rate of monetary expansion. It worried, however, that a serious and prolonged inflation could be initiated by a depreciation that occurred even when the money supply was being kept under control.

The Bank was concerned that depreciations "affect more than just import prices. Both the prices of domestic goods that compete with imports and goods sold in Canada of a type that can be exported will also go up." Furthermore, it worried that the secondary effect of these price increases could revive the inertial component of inflation: "a large and rapid compression of the purchasing power of Canadians because of exchange rate depreciation risks a self-defeating resurgence of inflationary demands for compensating increases in wages and salaries."[9]

There is no doubt that depreciation causes a temporary rise in the rate of inflation. But this does not present a very strong argument for resisting depreciation when inflation is as low and unemployment as high as they both were from mid-1982 through 1984. As the Governor recognized in the same speech from which the above quotations are taken, the size of the inflationary impact of these price increases depends on market conditions. In conditions of pervasive excess capacity, the impact is likely to be small. Sellers of import-competing and exportable goods are more likely to raise production than to raise the Canadian dollar price when a rise in the price of foreign goods shifts demand their way. And with depressed labor-market conditions, workers' insistence on being compensated for cost-of-living increases is likely to be reduced. Furthermore, the import prices themselves may increase less than proportionately to the depreciation under competitive market situations, as sellers of imports accept reduced profit margins to maintain this market share.

[9]Gerald K. Bouey, Statement prepared for appearance before the House of Commons Standing Committee on Finance, Trade and Economic Affairs, Ottawa, May 9, 1985; reprinted in *Bank of Canada Review*, May 1985, p. 23.

The empirical results of one study, by Fortin and Newton, suggest that the most important feedback mechanism in the Canadian Phillips curve is not one whereby workers demand cost-of-living increases but, rather, a mechanism whereby they try to catch up with other workers' wages.[10] It seems that "real-wage resistance" is not the problem in Canada (or in the United States) that it is in Europe. If these results are correct, the feared "secondary" effects of depreciation on wage demands are probably weak even when labor markets are tight.

Fortin and Newton also found that even the weak price-level catch-up mechanism they were able to detect is dependent not on consumer prices but on producer prices — that is, the mechanism seems to work not by inducing workers to demand cost-of-living adjustments but by making them demand a share of increased profits. Thus, it seems likely that the extremely low corporate profits and adverse terms-of-trade effects on export prices during the 1982–83 period would have swamped any effect of a modest depreciation on this price-wage feedback.

One Bank of Canada study shows the average results of using six different econometric models of the Canadian economy to simulate the effects on inflation of a one-time 10 percent depreciation caused by monetary expansion. The depreciation created a 3 percent inflation in the first year, and a 1.3 percent inflation in each of the next two years — that is, just over half the long-term effect of the depreciation on the CPI was realized in three years. (The effect on the Gross National Expenditure deflator was smaller.) These results were obtained from econometric models that do not take into effect the diminished inflationary impact likely as a result of unusually high unemployment, and yet, they are hardly the disaster of which the Bank has been warning Canada for years.[11]

Following the publication of the Bank's 1984 *Annual Report*, the Governor remarked that "anyone who advocates depreciation ought to say: "What I want is a reduction in real wages, a depression of real income,"[12] thereby suggesting that a reduction in real wages would have been particularly inappropriate. This suggestion reveals a basic misunderstanding of the role of real wages in the recovery from the 1981–82 recession. There are good empirical reasons for doubting that a reduction in real wages would lead to the vicious wage-price spiral that the Bank fears. Furthermore, one of the main impediments to the recovery

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[10]See Pierre Fortin and Keith Newton, "Labor Market Tightness and Wage Inflation in Canada," in Martin Neil Baily, ed., *Workers, Jobs, and Inflation* (Washington, D.C.: Brookings Institution, 1982), pp. 243–278.

[11]Brian O'Reilly, Graydon Paulin, and Philip Smith, *Responses of Various Econometric Models to Selected Policy Shocks*, Bank of Canada Technical Report no. 38 (Ottawa: Bank of Canada, July 1982).

[12]"Bouey affirms role of bank as defender of the currency," *Globe and Mail* (Toronto), March 20, 1985, p. B1.

has been Canada's high relative unit labor cost. Removing this impediment requires real wages to come down in Canada — although improvements in productivity obviously would help too. Instead of regarding real wage reductions as an evil to be avoided, the Governor should have taken the opportunity to remind Canadians — as he has elsewhere on several occasions — of the potential benefits of a real wage reduction.

Equating real wage reductions with a "depression of real income" just compounds this mistake. The way to increase real income is to raise real output, and that may well require a real wage reduction. People with jobs might find their real income squeezed — although not with more overtime and less frequent layoffs. But unemployed workers who finally obtain jobs because of an expanding economy will certainly find their income raised.

Exchange-Rate Expectations

Another reason why the Bank feared exchange-rate fluctuations has to do with credibility. Between 1978 and 1984, the Bank transferred its hope for maintaining credibility from hitting M1 targets to avoiding depreciation. Over the same period, it focused increasingly on the effects of its credibility on exchange-rate expectations and how they affect interest rates, rather than on inflation expectations and how they affect the actual rate of inflation. Thus, the Bank now has argued for the past several years that, aside from the credibility effect on wages and prices, an expansionary monetary policy perversely can drive interest rates up rather than down:

> A nation's exchange rate does not float in a vacuum. It can only float and find its level within the context of policies and perceptions of policies. A prescription for [expansionary monetary policy] would bring the Canadian dollar under intense downward pressure once it became evident that there was no policy concern about the Canadian dollar and the impact of any decline on inflation. In a situation where Canadian policy was perceived to be oriented towards repeating the inflationary mistakes of the 1970s, the exchange rate decline would have no evident limit. Interest rates would in fact rise sharply rather than fall as investors sought to get out of assets denominated in a currency that was only headed in a downward direction and as financial markets came to be dominated by the unpleasant prospect of much higher inflation rates.[13]

[13]Gerald K. Bouey, Address to the Board of Directors of the Bank of Canada, Charlottetown, P.E.I., June 26, 1984; reprinted in *Bank of Canada Review*, July 1984, p. 6.

In the Bank's 1984 *Annual Report*, the Governor cited the 1984 depreciation as an instructive example of this effect. He argued that after U.S. interest rates began to rise, the Bank's "attempts to moderate interest rate increases led to speculative positions being taken against the Canadian dollar, and the resulting downward pressure on the exchange rate in turn intensified the upward pressure on Canadian interest rates."[14]

No one who follows financial markets closely can doubt that policy perceptions play an important role in determining the state of exchange-rate expectations or that the expectation of depreciation requires either that the expectation be fulfilled or that interest rates be raised. Similarly, no one can fail to be impressed by the extreme volatility of those perceptions and expectations. What makes them change so often, and by so much, is something that no one understands very clearly. Thus, it is not hard to believe the Bank's claims that, at times, it can be extremely difficult to lower interest rates by easy money even in the short term. A completely made-in-Canada interest-rate policy certainly would require large fluctuations in the exchange rate, if it were possible at all.

But there is also reason to be skeptical of the Bank's assessment of the limitations on its ability to stimulate aggregate demand. Much of the "sensitivity" of exchange-rate expectations to the Bank's attempts at moderating U.S. interest-rate increases might have existed because of a (correct) market perception that the Canadian dollar was substantially overvalued, and the consequent belief that it would be reasonable to expect the Bank to allow a depreciation under the circumstances. If so, those expectations would carry the Canadian dollar down only to the point where the market believed that equilibrium had been restored, rather than generating the limitless fall the Bank feared. Under this hypothesis, once the dollar had fallen far enough, there would be no expectation of further depreciation and, hence, no upward pressure on interest rates.

Alternatively, the "sensitivity" of expectations in 1984 might simply have reflected market participants' growing awareness that the Bank's fundamental policy had changed in early 1984, as indeed it had. People's expectations might have been volatile and unpredictable because they were trying to adjust to a new and unfamiliar policy environment. It is easy to believe that bandwagon effects can develop in such a confused situation. But once people have become accustomed to a new environment, there is no reason to think that bandwagon effects will result every time the Bank makes an expansionary move.

There is a third likely alternative hypothesis. The Bank's policy of resisting, but not altogether preventing, a downward drift in the Canadian-U.S. dollar exchange rate with no particular target in mind itself may have intensified the speculation that arises when the Bank moves to a more

[14]Bank of Canada, *Annual Report 1984*, p. 18.

expansionary policy stance. When speculators see the exchange rate falling gradually, together with signs of a more expansionary policy, it is reasonable for them to infer that the Bank is willing to permit some depreciation but is trying to make the depreciation more gradual by resisting it. Under the circumstances, if they move quickly, speculators can profit from selling the dollar short, betting that the Bank has not yet allowed the full depreciation to a new equilibrium. If the Bank had a strategy of letting the dollar fall more suddenly, speculators would have less incentive to hop on the bandwagon because, seeing that a depreciation had occurred, they might believe that the exchange rate had already fallen to its new equilibrium value.

This is not to say that any of these alternative hypotheses is necessarily correct. No one really understands how exchange-rate expectations are formed. But because no one understands, it would be wrong to place a great deal of confidence in a proposition that depends crucially on any particular hypothesis — such as the one that monetary expansion typically raises interest rates because when people see the expansion and the resulting depreciation, they typically begin to expect further depreciation.

Even if the Bank is right that a monetary expansion leads to higher, rather than lower, interest rates in the short term, there is no basis for believing that such an expansion would be "wholly counterproductive". There are two reasons for this. First, even if nominal interest rates rise, there is no reason to suppose that they will do so by more than the inflation expectations of financial-market participants. And if they do not, then real interest rates will fall.

Second, even if monetary expansion cannot produce lower real interest rates in the short term, it still has a stimulative effect by directly providing liquidity and by reducing the real exchange rate. The liquidity effect is likely to be particularly powerful when the debt overhang from an inflationary past is causing a widespread liquidity shortage. And the greater the downward movement of the Canadian dollar caused by the speculative pressure that the Bank fears, the more stimulation one gets through the real exchange rate.

Thus, even if one accepts the Bank's argument that monetary expansion sometimes cannot stimulate aggregate demand through reducing interest rates, it is a non sequitur to conclude — as the Bank seems to — that, therefore, sometimes it cannot stimulate aggregate demand. In fact, as was pointed out in Chapter 4, standard macroeconomic theory implies that it is under just those circumstances in which the Bank cannot affect interest rates that its actions have the *greatest* impact on aggregate demand.

U.S. Developments

Another important aspect of the Bank's thinking had to do with U.S. fiscal deficits and the associated high U.S. real interest rates.

In June 1984, the Governor explained that "the essential problem from a global perspective is the fiscal situation and prospects for the United States. Because of high interest rates...the ability of all countries to pursue the mix of fiscal and monetary policies appropriate to their domestic circumstances is being impeded."[15] A large part of the 1984 *Annual Report* was devoted to explaining that "pressures on world credit markets generated by the extremes of the U.S. situation have meant that other countries have had to contend with the uncomfortable combination of high interest rates and very weak exchange rates for their currencies with the U.S. dollar." The report went on to explain how those problems had caused all countries to adopt restrictive policies in order to defend their currencies, but that this had been particularly true of Canada "because our links with the United States in trade and capital flows are far greater than those of other countries...[Those] countries are able to sustain weakness in their currencies against the U.S. dollar that is far greater than anything tolerable for Canada."[16]

I have already explained why high U.S. interest rates need not require Canada to pursue restrictive monetary policies, despite the inability to have a "made-in-Canada" interest rate, as long as Canadians are willing to allow depreciation, and why I believe that the Bank's fear of depreciation was misplaced. But these passages require one further observation.

Although Canada unavoidably is affected by U.S. developments, this does not imply that there is nothing Canadians can do about them. It would be just as irrational for Canadians to throw up their hands in despair when U.S. interest rates rise as it would be to pretend to be able to carry on as usual. The only rational course of action is to assess the external developments, to try to determine how those developments have altered available opportunities, and to look for the best course of action within that changed set of opportunities.

To be more specific, a rise in real interest rates in the rest of the world implies that, sooner or later, Canadian real interest rates also must rise. Because of this, real Canadian investment demand almost certainly will be less than it otherwise would have been. Similarly, real consumption demand will be less than it otherwise would have been if people begin saving more in response to the high rates. It follows that only a rise in government purchases of goods and services or a rise in net exports can maintain a full-employment level of aggregate demand. If the economy already is well below full employment, then to achieve full employment, these components of aggregate demand must rise even further. Barring a large increase in the size of government, a large part of the economy's productive capacity needs to be transferred toward satisfying Canada's

[15]Bouey, Address, June 26, 1984, p. 5.
[16]Bank of Canada, *Annual Report 1984*, pp. 6–7.

net foreign demand if full employment is to be achieved. And this transfer needs to be even greater than would normally occur as a result of domestic recession. To do this efficiently, the real exchange rate needs to be lowered.

A natural market mechanism exists that will accomplish this if monetary growth is kept on target. That mechanism is the fall in the nominal exchange rate that occurs as a result of higher external interest rates. Because exchange rates are among the most flexible prices in the economy, they may change by large amounts. This flexibility adds to the power and efficiency of the market adjustment — a large depreciation offers a large incentive to producers and consumers to play their part in reallocating resources.

The Bank's attitude toward exchange-rate fluctuations was dominated by its traditional concern for orderly markets: "To have such an important price swinging around widely would be about as disruptive an influence on the evolution of Canadian economic affairs as one could imagine."[17] By taking this attitude, the Bank prevented one of the economy's most powerful market forces from helping to stabilize output and employment.

Which Exchange Rate?

Depreciation or Appreciation?

Not only was the Bank overly concerned with the possible inflationary consequences of depreciation, there are also good reasons for thinking that it misjudged the amount of depreciation that was occurring. This is because too much of the Bank's attention was focused, either directly or indirectly, on the Canadian-U.S. dollar exchange rate. In fact, it seems likely that over the 1981–83 period, the Canadian dollar actually appreciated.[18]

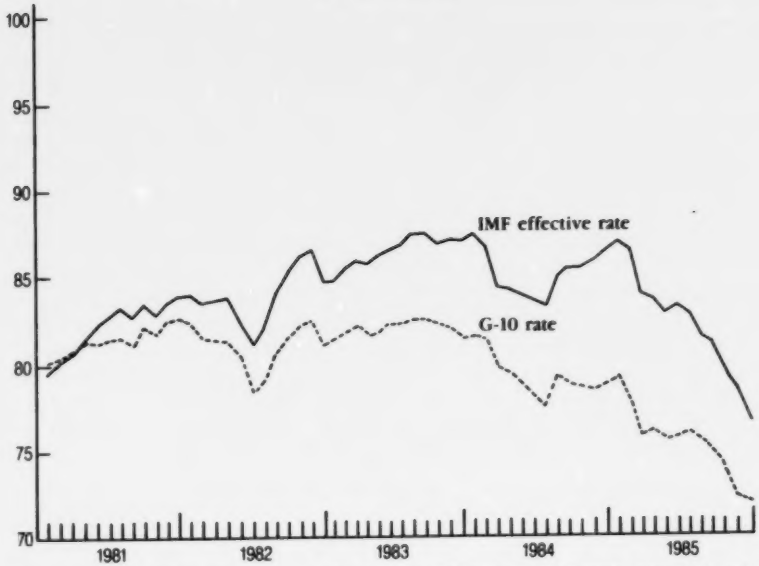
As was argued in Chapter 4, to address the question of whether the Canadian dollar has appreciated, one must look at a weighted-average exchange rate rather than at any single bilateral exchange rate. The Bank's own Group-of-Ten (G-10) exchange rate shows that the value of the dollar remained constant until early 1984. Thus, if the Bank was focusing exclusively on the Canadian-U.S. dollar exchange rate, it was misled into thinking it was allowing some gradual depreciation to occur.

On the other hand, even if the Bank was focusing on a weighted average such as the G-10 rate, it probably was still misled, because the G-10

[17] Bank of Canada, *Annual Report 1982*, p. 9.

[18] What is at issue is not the question of whether or not there was a *real* appreciation. The discussion in Chapter 4 leaves no doubt that a real appreciation occurred over the 1980–84 period and that an even bigger one occurred over the 1980–83 period.

Figure 8
Weighted-Average Exchange Rates, 1981–85
(1971 = 100)



Sources: ***Bank of Canada Review***, various issues, Table 11 (for G-10 rate); ***International Financial Statistics*** (International Monetary Fund), various issues (for IMF effective rate).

rate assigns too much weight to the U.S. dollar. A better-weighted average — such as the International Monetary Fund (IMF) effective rate — would indicate that, in fact, the Canadian dollar appreciated, because it appreciated greatly against almost every other major currency. This appreciation can be seen in the steady rise of the IMF effective rate, shown in Figure 8.

As was noted in Chapter 5, the G-10 rate assigns 82 percent of its weight to the U.S. dollar. That was the average U.S. proportion of Canada's merchandise trade with the G-10 countries during the 1977–81 period. But only 84 percent of Canada's trade during this period was with the G-10 countries. Thus, if one used a more comprehensive index, the appropriate weight attached to the U.S. dollar would be 69 percent (84 percent of 82 percent). More recently, the proportion of Canada's merchandise

trade with the United States has risen to about 75 percent, but even that is considerably less than 82 percent. Furthermore, one reason for this rise from 69 to 75 percent is the fact that the Canadian dollar appreciated so much relative to the European currencies. It is not obvious whether the weights before or after that appreciation are more appropriate.

Even if the U.S. proportion of Canada's total trade amounted to as much as 82 percent, this still would assign too much weight to the U.S. dollar in a weighted-average exchange rate. This is because the importance of another country's currency in determining the Canadian price level depends not just on the amount of trade Canada does with that country but also on the degree of competition with that country, for both exports and imports. The bulk of Canada's trade is with the United States. But the bulk of the competition comes from other countries, which get little or no weight in a trade-weighted average.

Take, for example, the Swedish kroner. It gets a weight of only one-half of one percent in the G-10 rate because Canada's trade with Sweden is very small. But this weighting understates the kroner's importance to Canada's price level, and particularly to the producer price level, because a substantial proportion of Canada's exports are in various forest-product markets in which the Swedes are among the main competitors.

Suppose the Canadian dollar were to appreciate substantially against the kroner but remain unchanged with respect to all other currencies. The G-10 rate would hardly change because of this, indicating almost no induced effect on the Canadian price level. But, in fact, there would be a substantial induced effect: since the value of the kroner would have declined relative to the Canadian dollar, Sweden would gain a competitive advantage over Canada. In tough international competition, even a small advantage could induce customers of Canadian exports to shift much of their demand to the Swedes. To meet this increased competition, Canadian producers would have to lower their prices. Sweden's importance as a competitor thus implies that the kroner should be given a weight of considerably more than one-half of one percent in the weighted-average exchange rate; accordingly, other currencies, including the U.S. dollar, should be given less weight than they currently get.

Consider another example. A large proportion of Canada's food imports comes directly from the United States. Thus, it might seem appropriate to give the U.S. dollar an equally large proportion of the weight when constructing a weighted-average exchange rate for the purpose of judging the effects of depreciation on the cost of imported food. But this is not necessarily true.

To see why not, take the extreme hypothetical example where the United States is Canada's only source of imported food. Even in this case, substantial weight probably should be given to non-U.S. currencies because

the global market in many food products is so large that the United States, big as it is, has relatively little influence over the world price. Suppose that the Canadian dollar depreciated against the U.S. dollar but not against any other currency. Logically, this would mean that the U.S. dollar would have appreciated against all other currencies. But no other exchange rate would have changed. Because the global food market is so large, the United States would find that the appreciation of its currency had no significant effect on the price it receives in terms of any foreign currency for its food exports. But remember that the Canadian dollar is one of those foreign currencies; thus, the price of food imported from the United States — expressed in Canadian dollars — would remain unaffected.

Paradoxical as it might seem, the fall in the Canadian-U.S. dollar exchange rate would have no effect on Canada's cost of living even though all Canadian food imports in this hypothetical example come from the United States. On the other hand, if the Canadian dollar had depreciated substantially against the currencies of all the other countries that make up the world food market but not against that of the United States, the world price of food measured in Canadian dollars indeed would have gone up. Again, an appropriate weighted-average exchange rate for the Canadian dollar would give substantial weight to the currencies of third countries with whom Canada competes for U.S. food imports, but with whom Canada does little trade.

The advantage of the IMF effective rate over the Bank's G-10 rate is that it is constructed so as to take these third-party effects into account. Instead of using weights proportional to Canada's trade with other countries, the IMF effective rate uses weights that are proportional to the effect that a depreciation of the Canadian dollar against the currencies of those countries has on the balance of payments.

This does not mean necessarily that the IMF effective rate is ideal. To address the crucial question of the effect of depreciation on Canada's cost of living, it would be better to have weights proportional to the effect on the CPI rather than on the balance of payments. And even then, the weights would be dependent on the particular econometric model specified by its builder.[19] A large, subjective element obviously goes into any such model and, hence, into the weights used in any such index.

Despite these problems, the IMF effective rate is arguably the best available indicator of Canada's nominal exchange rate for most purposes, since it is the only one that makes a systematic attempt to take crucial third-party effects into account. Furthermore, whatever problems exist with

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[19]The IMF rate is built up from the Multilateral Exchange Rate Model (MERM) described by Jacques R. Artus and Anne Kenny McGuirk, "A Revised Version of the Multilateral Exchange Rate Model," *IMF Staff Papers* 28 (June 1981): 275–309.

various measures, there is certainly good reason to believe that the Bank's G-10 rate assigns too great a weight to the U.S. dollar.

The Consequences of Focusing on the Canadian-U.S. Dollar Exchange Rate

This study has argued that the prolongation of Canadian monetary deceleration until 1984 is attributable to the Bank's unwillingness to depreciate. This unwillingness had especially severe consequences because of the Bank's narrow focus on the Canadian-U.S. dollar exchange rate.

In particular, the rise in world real interest rates that induced the Bank to follow such a restrictive policy originated in the United States and made the U.S. dollar appreciate relative to almost all other currencies. Even if the Bank had kept the Canadian dollar unchanged against an appropriate weighted average during the 1982–84 period, the rise in interest rates would have induced a monetary deceleration. In fact, the Bank allowed the Canadian dollar to appreciate along with the U.S. dollar — although not by as much. From the first quarter of 1982 to the first quarter of 1984, Canada's IMF effective rate appreciated by more than 3 percent. This substantial appreciation induced an even greater monetary deceleration.

Thus, the Bank did more than prevent the depreciation that would have allowed market forces to respond appropriately to U.S. developments. By tying the Canadian dollar so closely to the U.S. dollar, it caused those forces to act in the wrong direction.

Summary

There are three questionable aspects of the Bank's rationale for prolonging the monetary deceleration until 1984.

First, the Bank committed errors in judgment that led it to place too much weight on the objective of reducing inflation relative to reducing unemployment. Specifically, it placed too much weight on the credibility effect of its policies on the rate of inflation, and it was too ready to interpret the 1983 increase in velocity as a downward shift in the demand function for broadly defined money. It also may have been too ready to accept the hypothesis that Canadian wages and prices are less flexible than those in the United States although, on this point, there was no clear-cut evidence at the time.

Second, the Bank was excessively fearful of exchange-rate fluctuations. It acted as if currency depreciation had a larger impact on inflation than most econometric results suggest, even though under the conditions prevailing during the 1982–84 period, the impact was likely to be smaller than usual. The Bank based its unwillingness to endanger its credibility by allowing depreciation on a questionable theory of unstable exchange-

rate expectations. It also allowed its traditional concern for orderly foreign exchange markets to override the need for vital market adjustments in response to changes in the U.S. economy.

Third, the Bank paid too much attention to the Canadian-U.S. dollar exchange rate, rather than to an appropriate weighted-average exchange rate. By resisting depreciation against the U.S. dollar at a time when that currency was undergoing a substantial appreciation against the rest of the world's currencies, the Bank made the Canadian dollar appreciate as well. This appreciation was not reflected in the Bank's G-10 rate, but it was apparent in the more appropriate IMF effective rate, which gives less weight to the U.S. dollar. The appreciation intensified Canadian monetary deceleration and exacerbated the harmful effects of high world interest rates on the Canadian economy.

Many of the Bank's strategic and analytical lapses would not have occurred had it paid more attention to what was happening to the supply of broadly defined money, and had it been guided more by the ideas underlying the principle of Adaptive Monetary Control. These ideas warn against interpreting changes in velocity as shifts in the demand function for money. They also warn against the dangers of worrying too much about the volatility of the Canadian dollar exchange rate; indeed, they stress the need for exchange-rate movements as an automatic stabilizer for aggregate output and employment. They certainly would not have led the Bank to attempt to stabilize the Canadian-U.S. dollar exchange rate at a time when a substantial depreciation in that rate was needed to put broad monetary aggregates on a more suitable course. More generally, if the Bank had been using Adaptive Monetary Control, then that principle's emphasis on the relatively modest task of keeping the supply of money on course, rather than trying more vigorously to control final targets like inflation and unemployment, would have counteracted the Bank's tendency to let monetary deceleration get out of hand because of an overriding concern with the problem of inflation.

7

Managing the Transitions: An Assessement

The Transition from High Inflation

The Bank of Canada must be given credit for having achieved its main objective during the 1982–84 period — that of bringing inflation down from double-digit rates. Inflation is still around 4 percent, but there is good reason to think that it will continue falling, although further depreciation temporarily may halt or slow down the fall.

The cost of victory against inflation was the massive 1981–82 recession. But the rewards of victory are also enormous. As Canadians continue to recover from debts incurred under inflation, as uncertainty about the value of money gradually diminishes, and as distortions created by inflation through the tax system continue to be reduced, those rewards will continue to grow.

One can criticize the Bank for having waited so long before bringing the rate of monetary expansion under control. If Canada's monetary deceleration had started in 1975 rather than in 1980, a less severe recession might have been necessary to bring inflation down, because inflation was less entrenched in 1975 than it had become five years later. The Bank now realizes, with the benefit of hindsight, that Gradualism was too gradual. But hindsight was not needed. The Bank would not have made the mistake of waiting so long had it listened to critics — such as Thomas Courchene — who argued right from the beginning of Gradualism that more attention needed to be paid to keeping broadly defined money under control, rather than focusing, as the Bank did, first on M1 and later on the Canadian-U.S. dollar exchange rate.[1]

One also might be tempted to criticize the Bank for having acted so precipitously in 1981, when it switched suddenly from doing almost nothing to initiating a policy of severe restraint. This certainly was not the optimal way to reduce inflation. But it is not fair to add this criticism to the first one. Once the mistake of waiting five years or more was made, drastic action was called for. By 1981, the problem of inflation had become so great that it was too late for gradual policies.

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[1]As early as 1976, Courchene made the argument that the Bank should focus on M2. See Thomas J. Courchene, *Monetarism and Controls: The Inflation Fighters* (Montreal: C.D. Howe Research Institute, 1976).

Looking back, it is easy to say that the Bank could have been less restrictive in 1981 and still the recession would have been big enough to start inflation on the way down. But, to a considerable extent, factors in addition to monetary deceleration helped to make the recession as severe as it was. Without these factors, the Bank's policies might not have resulted in overkill. In 1981, the Bank could not have foreseen all these additional factors, and it probably was wise to err on the side of reducing inflation, rather than to risk that its policies again would prove too gentle.

The Bank must also be given credit for finally beginning the second phase of the transition from high inflation, ending the four-year monetary deceleration, and starting to close the gap between the actual and equilibrium quantities of real money. Allowing the deceleration to continue any longer could have provoked another recession when the economy was still well below full employment. Even stabilizing money-growth rates at the levels of late 1983 might have required years of slow recovery before a return to prosperity. The Bank's willingness to abandon its long-standing exchange-rate policy probably spared Canadians these outcomes.

The main criticism of the Bank's management of the transition from high inflation is that it has been too slow with the second phase. The monetary revival that finally started in early 1984 was too little and too late. There is now reason to believe that the revival is well under way, but even at the end of 1985, the real M2 + gap was 3.5 percent and the unemployment rate was over 10 percent.

There is no definitive analysis of how optimally to manage a transition to lower inflation.[2] It all depends on one's views about the particular nature of the inertial component of inflation and about the dynamic response of inflation to depreciation, on how much weight one attaches to the costs of unemployment versus inflation, and on how heavily one discounts benefits — such as those from reduced inflation — that will occur far into the future. But an analysis that assumes no effect of policy announcements on people's inflation expectations implies that the real money gap should start being eliminated shortly after a brief initial period in which heavy contractionary pressure is applied, and the inertial component of inflation begins to fall. If one considers that changes in real balances affect output only with a lag, then after the brief initial period, real balances should be raised *above* their long-term path (as shown in Figure 1 in Chapter 2) with a sudden burst of monetary growth and then be allowed to fall gradually back down.

It would be unrealistic to think the Bank could engineer this sort of policy precisely. Monetary expansion cannot be turned on and off with exact timing. Furthermore, the lags with which the Bank's policies affect real activity and inflation cannot be predicted accurately.

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[2]For a systematic analysis of the question, see E.S. Phelps, *Inflation Policy and Unemployment Theory* (New York: Norton, 1972).

Nevertheless, the Bank could make some attempt to approximate the optimal policy, at least roughly. In particular, once a sizable real money gap obviously has been opened up and real activity obviously has fallen, it makes sense to attempt to stabilize the real money gap, even if there is not yet any sign that inflation has started to come down. At that point, there would be substantial downward pressure on the rate of inflation. Stabilizing the gap would keep the pressure on; it would not involve any relaxation of monetary restraint. But allowing the gap to continue to grow would add more and more downward pressure on inflation, resulting in an even further deepening of the recession.

To stabilize the real money gap before inflation has started noticeably to come down would require an increase in the rate of monetary expansion. To reverse monetary deceleration in this way before inflation has started down might seem risky, especially if one is worried about the effects of this reversal on expectations. So, to be on the safe side, the Bank might attempt just to stabilize the rate of monetary expansion, rather than to stabilize the real money gap. If the rate of monetary expansion could just be stopped from falling any further, then the real money gap would continue to grow. This would add to disinflationary pressure until the rate of inflation came down to within about 3 percentage points of the rate of monetary expansion, but at least it would not grow by as much as if the monetary deceleration were allowed to continue.

It also makes sense to attempt to reduce the real money gap once inflation obviously is on its way down. This is because inflation, as it starts coming down, becomes less of a problem, while the unemployment that the real money gap creates becomes more of a problem. Again, it might seem risky to reduce the gap before one is sure that inflation is coming down for good. So, to be on the safe side, the Bank might attempt just to raise the rate of monetary expansion by enough to stop the gap from growing any further.

After inflation has come down to a level that can be tolerated for a few years, but before it has fallen to its long-term target of zero (or perhaps a small positive rate), it then makes sense to attempt vigorously to close the gap — perhaps even to risk overshooting and making the gap become negative — before bringing the rate of monetary expansion back down to its long-term rate. This would put the economy back on the road to full employment with a strong likelihood that inflation would continue to fall.

To summarize this analysis, a conservative and not overly ambitious policy that errs on the side of reducing inflation would attempt to manage the second phase of the transition in the following stages:

(a) Stabilize the rate of monetary expansion as soon as there is obviously a large real money gap and a great deal of excess capacity in the economy, even before inflation has started to come down.

(b) Stabilize the real money gap, by raising the rate of monetary expansion, as soon as inflation obviously has started to come down.

(c) Close the real money gap vigorously once inflation has fallen to a rate that can be tolerated for a few years.

(d) Put the money supply on its steady long-term target path once the real money gap has been closed.

There is no guarantee that such a policy could be adhered to strictly. Other events might intervene calling for a deviation from the plan. And subjective judgment would have to be used all along the way to determine which broad aggregate was most reliable, exactly when to start each stage, and so forth. But this sketch of disinflation policy seems at least to offer a sensible, conservative benchmark.

The time to have attempted stage (a) probably was sometime in early or mid-1982. The average real money gap for 1982 ranged from zero (M2) to 9 percent ($M3^{++}$), and there was no doubt that there was huge fall in real activity. That was the time at least to have stabilized the rate of monetary expansion.

There is evidence that the Bank made some move toward monetary ease in 1982. Its resistance to allowing the Canadian dollar to depreciate against the U.S. dollar obviously was less than it had been in 1981. But it did not move vigorously enough to stabilize the rate of monetary expansion.

The Bank had an opportunity to stabilize the rate of monetary expansion in the second half of 1982, when U.S. interest rates came down so quickly. The United States had a burst of monetary expansion at the time, and all the Bank needed to do was to end monetary deceleration. To accomplish this, the Canadian dollar would have had to depreciate further against the U.S. dollar, because of Canada's weak demand for credit. But the Bank was unwilling to allow any more depreciation. From mid-1982 to the fourth quarter of 1983, it kept the Canadian-U.S. dollar exchange rate roughly constant, and monetary deceleration continued.

The time to have attempted stage (b) clearly was sometime in 1983. By mid-1983, the year-to-year rate of Consumer Price Index (CPI) inflation had fallen to 5.5 percent and the quarter-to-quarter rates had been below 6 percent for three quarters. Inflation obviously had started down and even though there was still considerable uncertainty about its future course, there was no need to keep the real money gap growing. Again, there is evidence of a small move toward monetary ease in 1983, but this move was still not vigorous enough to stop the real money gap from continuing to grow.

The time to have attempted stage (c) probably came in late 1983 or early 1984. The rate of CPI inflation was down to the 4 percent range, and

unemployment had become an enormous social problem. The Bank should have been closing the real money gap vigorously at that time. Instead, it waited until late 1984 or early 1985.

Stage (d) already should have been accomplished in 1985. Instead, because the Bank was late in accomplishing the earlier stages, it probably will not be able to accomplish this stage before sometime in 1987.

Thus, even by a conservative benchmark, the Bank was late in accomplishing each stage of phase two of the transition. Its policy was more contractionary than the benchmark policy that already errs on the contractionary side. Moreover, this error cannot be attributed entirely to the problem of controlling the money supply. To a large extent, it must be attributed to the Bank's policies. When the Bank finally gave up the policies that had maintained the Group-of-Ten (G-10) exchange rate within a narrow band for five and a half years, the four-year monetary deceleration at last came to an end. Had the Bank been willing to give up those policies earlier, the deceleration would have ended sooner.

The Strategic Transition

The Bank clearly was justified in abandoning the strategy of Gradualism because of instability in the demand function for M1. Gradualism simply was not working.

The heavy emphasis that the Bank began to place on avoiding depreciation also might have been justifiable under the circumstances of the late 1970s and early 1980s because of the growing problem of inflation. The critique in the previous section of the Bank's fear of the inflationary consequences of depreciation in the 1982–84 period does not necessarily apply to its similar fear in the 1979–81 period, when there was far less slack in the economy and when inflation had become such a pressing problem that even a temporary two or three point rise in inflation would have been extremely unwelcome.

Furthermore, one of the key elements of the Bank's strategy since 1978 seems to have been quite sensible. This was the Bank's policy of reacting to exchange-rate pressure from a rise in U.S. interest rates — or from a decrease of confidence in the Canadian dollar — by letting some of the pressure come out in the form of a lower exchange rate and some in the form of higher interest rates.

In fact, this sort of reaction is just what the Bank would be led to adopt if it were guided by the principle of Adaptive Monetary Control. If the Bank did not react to a rise in U.S. interest rates by increasing Canadian interest rates, the resulting depreciation would lead to an increase in the demand for credit — to finance an increase in spending — which, in turn, would cause the supply of money to rise. On the other hand, if the Bank matched the rise in U.S. interest rates point for point, the fall in the

demand for credit would cause the money supply to fall. To keep the money supply on target, the Bank should do as it has done: take the intermediate course of allowing interest rates to rise somewhat and the exchange rate to fall somewhat.

Indeed, the Bank may have been justified in intervening on occasion to quell speculation in the foreign exchange market, even when that meant allowing the money supply to go temporarily off target. Exchange-rate expectations are extremely volatile, and the occasional departure of the money supply from a constant growth path might be justifiable to prevent wild fluctuations in the exchange rate that serve no useful social purpose.

However, the analysis of the previous chapter offers reasons for believing that the Bank has exaggerated the importance of unstable exchange-rate expectations. Furthermore, excessive concern with exchange-rate stabilization leads to excessive fluctuation in the rate of monetary expansion, which can have even more serious consequences than fluctuations in the exchange rate. From 1978 to 1984, the Bank paid too much attention to the exchange rate and too little to the supply of money.

Specifically, although the Bank's shift in emphasis to exchange-rate stabilization eventually led to the monetary deceleration needed to fight inflation, the deceleration would have come earlier, and it would not have been so prolonged, if the Bank had shifted its emphasis to controlling the broad monetary aggregates that are the focus of Adaptive Monetary Control.

Three other aspects of the Bank's strategy concerning exchange-rate stabilization should be mentioned at this point. The first is that stabilizing the Canadian-U.S. dollar exchange rate, or even the Bank's G-10 rate, made the Canadian dollar vulnerable to shocks that affect the value of the U.S. dollar relative to other currencies. It also prolonged the unwanted monetary deceleration during the 1982–84 period. In future, if the Bank wants to adopt a strategy of exchange-rate stabilization, it should pick a weighted-average rate that assigns far less than 82 percent of its weight to the U.S. dollar.

The second aspect has to do with the Bank's strategy of resisting depreciation of the Canadian-U.S. dollar exchange rate with no clearly announced target for that rate. As was argued above, this strategy is likely to encourage just the sort of speculation that the Bank found so troublesome when it made a move toward a more expansionary policy. The strategy of ironing out short-term exchange-rate fluctuations may be feasible. The strategy of fixing the exchange rate in the long term may also be feasible. But the strategy of trying to make long-term movements more gradual ultimately will fall victim to the speculative pressures that it induces.

In short, if the Bank wants to stabilize the exchange rate, it should provide a clear, credible message of its intentions. Such a message would encourage speculators to work for the Bank — to buy dollars when the exchange rate is temporarily below the Bank's target value and, thus, to help bring the exchange rate up. Instead, the Bank has encouraged speculators to work against it — to sell dollars when the Bank is trying to keep the exchange rate temporarily high.

The third aspect has to do with the effect of the Bank's strategy on the fiscal deficits of Canadian governments. The first thing to note in this respect is that although fiscal deficits now may pose a serious long-term problem, they were actually helpful during the 1983–84 recovery. Without them, the recovery would have been even weaker than it was. In fact, given that the Bank stabilized the G-10 rate, deficit reduction by itself in 1983 and 1984 would have been doubly damaging. By reducing the demand for credit in Canada, deficit reduction would have made the monetary deceleration even more severe than it was. The Bank could not have prevented this slowdown in credit demand from slowing monetary growth except by allowing it to exert downward pressure on domestic interest rates, which would have produced a depreciation of the dollar.

Nevertheless, the Bank's policies have aggravated the problems posed by fiscal deficits. It has been observed often that the U.S. recovery was not as healthy as it should have been because of the imbalance between tight monetary policy and easy fiscal policy, both of which push up interest rates and crowd out expenditures in some sectors. By tying the Canadian dollar so closely to the U.S. dollar, Canada imported this U.S. policy imbalance. In fact, because of the much stronger demand for credit in the United States, Canada imported an even worse imbalance. There were large fiscal deficits in both countries. But the money supply was expanding much more rapidly in the United States than in Canada during the 1983–84 recovery.

Had the Bank changed its strategy more rapidly, thereby permitting a vigorous monetary revival to take place earlier than in 1985, the imbalance between monetary and fiscal policy would have been greatly alleviated, not only directly but indirectly. By easing real interest rates, this move would have reduced the debt-service component that accounts for so much of the deficit. And once the Bank had joined the cause of fighting the recession, the fiscal authorities would have been free to take important deficit-cutting actions sooner than they did, with less concern over the short-term employment cost of such a move. A strategy along these lines would have helped reduce the structural deficit, stimulated real output, and, thus, automatically raised tax revenues. The Bank thus would have made fiscal deficits less of a threat to Canada's future.

Finally, the Bank must be given credit for having lessened its concern for exchange-rate stabilization, thereby permitting a monetary revival to occur. It is still too early to tell just what the Bank's attitude toward the exchange rate will be. But if recent indications that the Bank is beginning to pay more attention to the money supply and less to the exchange rate turn out to be correct, then it is moving in the direction of Adaptive Monetary Control. An assessment of the Bank's strategic transition can then be summed up in the same terms as were used to assess the transition from high inflation: it took a long time, but eventually the Bank did the right thing.

8

Looking Ahead: Adaptive Monetary Control as a Strategy for Coping with an Uncertain World

If monetary expansion continues at the rate that prevailed through 1985 and into 1986, then by sometime in 1987, the real money gap probably will be closed. Before this occurs, it would be prudent for the Bank of Canada to begin taking measures to reduce gradually the rate of monetary expansion down to the 3 percent range consistent with a long-term rate of inflation close to zero.

This slowdown in monetary growth would put Canada into the final stage of the transition from high inflation. After that stage has been entered, the Bank should to try keeping the money supply close to its noninflationary constant growth path — that is, to try following Adaptive Monetary Control.

It is still too early to tell whether the Bank will pay sufficient attention to the broad monetary aggregates to keep them close to their target path, or whether it will allow sufficient exchange-rate flexibility to accomplish the task. The Bank's willingness to allow vigorous monetary expansion to proceed through 1985 and into 1986 despite a substantial depreciation is a good sign. But how much of this is due to a desire to keep monetary expansion at an appropriate rate and how much is just an attempt to provide sufficient reserves to the banking system to forestall a serious banking crisis is not yet clear.

Chapters 2 and 3 presented the case for Adaptive Monetary Control in the abstract. The remainder of this chapter tries to make that case more concrete — to show how it can be a useful strategy for coping with the kinds of challenges that are most likely to confront monetary policy in the second half of the 1980s.

The most widely discussed alternatives to Adaptive Monetary Control are nominal-income targeting and exchange-rate stabilization. Chapter 2 pointed out why nominal-income targeting would not be much different from Adaptive Monetary Control. This chapter examines seven possible challenges to determine what probably would happen if the Bank adopted Adaptive Monetary Control, compared with what would happen if the Bank kept the exchange rate — either the Canadian-U.S. dollar rate or the similar Group-of-Ten (G-10) rate — on target. The analysis proceeds on

the assumption that by the time these challenges are posed, the second stage of the transition will be near completion, that the real money gap will have been closed, and that the economy will have returned to the neighborhood of a full-employment equilibrium.

Challenges to Monetary Policy

Depreciation of the U.S. Dollar

The first challenge is already under way: a fall in value of the U.S. dollar on world markets, occasioned either by official intervention of the kind proposed by the September 1985 meeting of the Group-of-Five finance ministers, by a glut of U.S. securities on world markets as a result of large U.S. current account deficits, or by a decline in confidence in the U.S. dollar.

If the Bank responds by keeping the Canadian-U.S. dollar exchange rate fixed, the Canadian dollar will have to depreciate along with the U.S. dollar. Early in 1986, most observers believed the U.S. dollar was still very overvalued, so the depreciation could be quite substantial.

If the Bank allows the Canadian dollar to depreciate against other currencies, it will have to undertake operations to raise the rate of monetary expansion.[1] If the depreciation is substantial, the result will be a substantial increase in inflationary pressure in Canada, both from the direct effect of depreciation on the Canadian price level and from the increase in aggregate spending that would be produced by the excess monetary expansion. As long as the depreciation is temporary, the resulting inflation also will be temporary. But the fact that both depreciation and excess monetary expansion then will be at work could make the rise in the price level large enough to pose a serious problem.

Next, suppose the Bank keeps broadly defined money on target. U.S. interest rates might rise to reflect the depreciation of the U.S. dollar, but that in itself will not necessarily affect Canadian interest rates. The Canadian dollar will appreciate against the U.S. dollar,[2] although Canada's close trade links with the United States probably will keep the Canadian dollar from appreciating as much as other currencies.

This appreciation against the U.S. dollar will hurt net exports, but that will tend to be offset by depreciation against other currencies. Also, any fall in net export demand will induce decreases in Canadian interest rates and in the exchange rate, which will tend to stabilize aggregate spending. In

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[1] This assumes, of course, that the Canadian dollar is not overvalued to begin with, which it probably will be until the transition from high inflation is completed.

[2] In fact, the Canadian dollar has depreciated considerably against the U.S. dollar since the U.S. dollar began to slide in early 1985. That is at least partly due to the fact that the Bank's monetary policy is still in a transition phase with a rate of monetary expansion well above 3 percent.

sum, there is no reason to think that Canada will suffer significant adverse effects on the rate of inflation or on the level of real activity.

The Falling World Price of Oil

Another challenge that has already been posed is a large decline in world oil prices, which, if not reversed, will have important medium- and long-term effects on Canada. Initially, this decline may tend to raise unemployment by shifting demand even further away from the resource-based economies of Western Canada. But in the medium term, it should reduce unemployment by stimulating growth in manufacturing industries for which oil is an important input. It probably will put some downward pressure on the Canadian dollar because of its initial depressing effect on economic activity and because Canada is a net exporter of energy; a temporary real depreciation also should result because of the deterioration in Canada's terms of trade.

If the Bank keeps the Canadian dollar tied closely to the U.S. dollar, then some of the positive effects on Canadian employment may be lost. This is because the effect of the oil price decline should be to strengthen the U.S. dollar.[3] If that occurs, then the Canadian dollar also will have to appreciate relative to other currencies. As a consequence, the initial increase in unemployment will be larger and the subsequent decline will be less. The real appreciation, however, should cause a temporary decrease in the inflation rate; the initial decrease in one of the important costs of manufacturing should hasten that decrease.

If, however, the Bank follows the principle of Adaptive Monetary Control and keeps the supply of broadly defined money on track, then the Canadian dollar will depreciate relative to the U.S. dollar. Canada then will get more of the employment benefits of the fall in oil prices. Canada will not get the temporary reduction in inflation that comes through currency appreciation, but will get the temporary reduction that works through the cost of inputs in manufacturing.

U.S. Monetary Growth

Suppose that in the United States, the Federal Reserve, perhaps under pressure to monetize the U.S. government deficit, lets money growth get out of hand and causes inflation to take off. This seems unlikely with Paul Volcker as Chairman, but it is not completely out of the question.

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[3]That is, by reducing expenditures on energy imports, the price decrease should reduce the U.S. current account deficit, relieving some of the downward pressure on the U.S. dollar. This is not, however, the only effect at work. It is possible that the demand for U.S. dollars to finance the world oil trade could be depressed, which would tend to add to the downward pressure on the U.S. dollar. Thus, the appreciation of the U.S. dollar, while likely, is not certain to occur.

The political pressure to inflate away some of the U.S. government's debt is particularly strong. With the United States' huge current account deficit, foreigners hold more and more of that debt, and the United States is in the rare position of having most of its foreign debt denominated in its own currency — that is, of having the power to inflate it away.

If this happens and the Bank of Canada keeps the exchange rate fixed against the U.S. dollar, the potential exists for a re-enactment of the problems that occurred during the late 1960s and early 1970s, when U.S. inflation was imported into Canada. During that episode, as U.S. prices began to rise relative to Canadian prices, the pressure to expand the Canadian money supply in order to keep the exchange rate down led to inflation in Canada.[4]

There is a clear-cut conflict between Adaptive Monetary Control and exchange-rate stabilization in this case. Only by allowing the exchange rate to appreciate and keeping a lid on monetary growth could Canada avoid being drawn once more into a U.S.-led inflation.

U.S. Deficit Reduction

One event that probably will have to come about sooner or later is an end to the U.S. government's huge structural deficit, especially if the Gramm-Rudman act survives judicial review.[5] By reducing strains on credit markets this will have the effect of reducing world real interest rates. By reducing the level of aggregate demand in the United States, it also might provoke a temporary slowdown of the U.S. economy. Another possible event with almost identical consequences is a slump in U.S. investment.

How far interest rates and real activity fall will depend on the actions of the U.S. Federal Reserve. It is probably best to assume that the Federal Reserve will not attempt to lean against the wind of falling interest rates — that it will not allow the growth of broadly defined money to be reduced. If so, then it is almost certain that the U.S. dollar will depreciate against European and other currencies. (Indeed, the recent slide of the U.S. dollar is at least partly attributable to the increasing likelihood of deficit reduction.)

The likely effect on Canada will be similar to the case of U.S. depreciation examined above. The main difference is that the fall in interest rates will tend to stimulate aggregate spending in Canada, while the drop in spending in the United States will tend to reduce the net export component of spending in Canada.

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[4]For a detailed account of these events, see Thomas J. Courchene, *Money, Inflation, and the Bank of Canada: An Analysis of Canadian Monetary Policy from 1970 to Early 1975* (Montreal: C.D. Howe Research Institute, 1976).

[5]In early July 1986, part of the Gramm-Rudman act was declared unconstitutional, but technical changes in the act are possible to restore its legality.

Thus, if the Bank of Canada keeps the Canadian-U.S. dollar exchange rate fixed, the Canadian dollar will have to depreciate along with the U.S. dollar, which could pose a serious inflation problem because the rate of monetary expansion will have to be allowed to rise above its target value during the course of the depreciation.

Under Adaptive Monetary Control, depreciation will not necessarily occur and, therefore, there will be no strong upward pressure on the Canadian price level.[6] The fall in interest rates, however, will raise the demand for M1. If the Bank keeps expanding the base fast enough to keep broadly defined money on target, M1 will go through a period of abnormally rapid growth. As in the 1982–83 period, this growth will have no inflationary consequences.

Canadian Deficit Reduction

Another possible event is that governments in Canada finally will make a strong move toward eliminating their structural fiscal deficits. This will become increasingly likely as the economy returns to full employment and the pressure for fiscal stimulation is thereby reduced.

The immediate effect of deficit reduction will be a slowdown of aggregate demand, dampening the growth of output and employment. Several observers have pointed to the need to accompany budget cuts with an easing of monetary policy in order to offset this slowdown in activity.

Under a regime of exchange-rate stabilization, the employment effects of budget cuts will be amplified rather than offset. The reason for this is that, in order to keep the exchange rate constant, the Bank will have to keep interest rates from falling, which will require it to cut the rate of monetary expansion. This will compound the effects of a restrictive fiscal policy by adding to it a restrictive monetary policy.

Adaptive Monetary Control, however, will keep the money supply on target and, therefore, the fall in interest rates will offset the slowdown. As interest rates fall, so will the exchange rate;[7] this, too, will help offset the reduction in domestic demand. In this sense, the desired easing of monetary policy will occur automatically.

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[6]There is, however, the possibility that if the U.S. government takes action to counter its deficit while the Canadian government does not, investors will lose confidence in Canadian macroeconomic policy and dump their holdings of Canadian dollars, causing a depreciation. I do not think that this confidence effect would outweigh the fundamental forces of supply and demand, but one can never be sure.

[7]As in the previous example, a strong confidence effect conceivably could upset this prediction, in this case by bolstering confidence in Canadian macroeconomic policy and, hence, strengthening the Canadian dollar.

A Banking Crisis

The recent collapse of two regional chartered banks in Canada may have shaken some Canadians' confidence in the strength of the banking system. In fact, Canada traditionally has had one of the strongest banking systems in the world, and there is no reason to think that the problems of small, regional banks directly affect the strength of the major chartered banks that constitute the bulk of the system. But the current international debt situation is uncertain enough that it is hard to judge the strength of even the most reputable banks. If Latin American and other major debtor nations begin to default on a large scale, failures of big North American banks with substantial international portfolios could occur. Canadian depositors, sensitized by recent Canadian experience, could start a scramble for liquidity and touch off a full-scale banking crisis.

Under such a situation, the main problem with stabilizing the exchange rate is that if major Canadian banks are seen to be in trouble, international investors might rush to sell their Canadian dollar assets and look for a safer place in which to invest.[8] In the face of such pressure, the only way to keep the exchange rate fixed is to take the kind of restrictive monetary measures that make a collapse even more likely.

The experience of previous banking crises — such as the one that occurred at the start of the Great Depression — leaves no doubt that the worst thing a central bank can do under the circumstances is to let the money supply collapse. It may take vigorous expansion of the monetary base to prevent such a collapse. The virtue of Adaptive Monetary Control is that it is designed to stop the money supply from collapsing: as nervous depositors begin withdrawing their savings accounts, the Bank automatically injects reserves into the system. If the exchange rate begins to fall, the Bank will not intervene with restrictive measures to stop the depreciation.

Financial Innovations

One of the events least favorable to Adaptive Monetary Control is a continuation of financial innovations that cause large, permanent, downward shifts in the demand for money. It was argued in Chapter 3 that this has not yet been a problem with broadly defined money in Canada. But as the global financial system becomes more sophisticated and more integrated, and as the traditional barriers between different sectors of the financial market begin falling, the possibility of large shifts in the demand for broadly defined money becomes more likely.

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[8]There is also the problem that the policy lets foreigners remove their assets at a price that is supported by the Bank of Canada — in effect, this forces Canadians to subsidize foreigners at a time of crisis.

There is no reason to think that exchange-rate stabilization will avoid the potential inflationary consequences of such shifts, unless those shifts are restricted to Canada. If they are global shifts resulting from the further integration and streamlining of world financial markets, or from technological breakthroughs that spread quickly through the world market, all countries will have to reduce their monetary growth rates accordingly to avoid inflation. Under a regime of exchange-rate stabilization, Canada's monetary growth rate will be reduced appropriately only if other countries do the same. And the dangers of relying on others for the conduct of Canadian monetary policy are only too well known.

On the other hand, keeping the money supply on target will not help either. One can adjust the target ranges in response to realized or even anticipated shifts in the velocity of money, but the shifts may be larger (or smaller) than anticipated and *ex post* target adjustments may not keep pace with the realized shifts.

Conclusion

To put this analysis in perspective, it should be noted that the Bank of Canada is unlikely to pursue either an absolutely fixed exchange rate or an absolutely fixed rate of monetary expansion. Nor should it. It is highly unlikely, for example, that the Bank would blindly keep the exchange rate fixed in the midst of a Canadian banking crisis. Similarly, in the event of a fall in the U.S. government deficit, the wise course might be for the Bank to aim for a modest increase in the rate of monetary expansion to offset some of the slowdown in real activity.

Furthermore, it should be noted that the main problem of monetary policy is not how to react to a single, isolated event whose occurrence can be perceived immediately, and whose quantitative effects can be predicted precisely. Rather, the problem is to determine what strategy to adopt for coping with an uncertain world in which many significant events take place simultaneously — some of which are not yet perceived and none with precisely predictable consequences. Typically, some of these events will call for more monetary restraint and others for less. What the Bank needs in such a world is not a detailed contingency plan for each event but a simple guideline that is unlikely to lead to disaster and that is known to produce tolerable outcomes under most circumstances. If the plan offers a good chance of improvement over past policies, then so much the better.

This is the sense in which a policy of Adaptive Monetary Control appears to be superior to an alternative strategy that emphasizes stabilizing the exchange rate. Neither policy is optimal in any clearly defined sense. Exchange-rate stabilization may even yield a superior outcome under some

circumstances. But Adaptive Monetary Control — stabilizing the rate of monetary expansion — would not lead to disaster except possibly in the event of financial innovations on a scale not previously experienced. Even in that event, it is not at all clear that exchange-rate stabilization would do better.

Adaptive Monetary Control allows monetary policy to use the economy's built-in stabilizers. It guards against the worst outcomes of sustained inflation and deep depression. It is a workable strategy that does not aim at unrealistic objectives but generally produces tolerable outcomes. If it had been implemented at the beginning of Gradualism, it would have made the Bank of Canada's long struggle against inflation faster, more effective, and less costly. Indeed, if it had been implemented in 1970, it would not have allowed inflation in the first place. Adaptive Monetary Control may not be perfect, but there is no known strategy that offers the Bank a better guide for meeting the challenges of the future.

Policy Analysis Committee

The C.D. Howe Institute Policy Analysis Committee (HIPAC) was formed in 1980 from the Canadian Economic Policy Committee, established in 1961. This change was brought about to help streamline the Institute's activities and to improve the process of accountability of staff to the Institute's members.

HIPAC's membership is drawn primarily from business and labor organizations that are members of the Institute. To encourage diversity of perspective, HIPAC also includes members from the academic world, from agricultural organizations, and from the professions. Two Regional Advisory Committees have been established across the country to assist HIPAC in determining its research agenda and to ensure that the research conducted by the Institute on its behalf is relevant and reflective of regional points of view.

Full meetings of HIPAC's membership are held twice each year. The purposes of these meetings are to hear expert speakers on current policies, to engage in frank discussion of topics raised by members, and to identify a research program that the Institute can carry out effectively to improve public understanding of important policy issues. The professional completion of this program is then supervised by the Institute, which coordinates with the HIPAC Executive Committee.

The Chairman of HIPAC is H.A. Hampson (President and Chief Executive Officer, Canada Development Corporation).

Recent publications prepared in conjunction with HIPAC include:

- *Closing a Trade Deal: The Provinces' Role*, C.D. Howe Institute Commentary no. 11, by Murray G. Smith (August 1986).
- *New Stresses on Confederation: Diverging Regional Economies*, Observation no. 28, by Edward A. Carmichael (June 1986).
- *Paying by the Installment Plan: Analysis of the February 26 Federal Budget*, C.D. Howe Institute Commentary no. 10, by Wendy Dobson and Edward A. Carmichael (March 1986).
- *Reorienting the Canadian Economy: Policy Review and Outlook, 1986*, by Edward A. Carmichael (December 1985).
- *Keeping an Eye on the Ball*, C.D. Howe Institute Commentary no. 9, by Wendy Dobson (September 1985).
- *Taking the Initiative: Canada's Trade Options in a Turbulent World*, Observation no. 27, by Richard G. Lipsey and Murray G. Smith (May 1985).